TACTICAL COMMON DATA LINK (TCDL) PROGRAM

PROGRAM SOLICATION

MDA972-97-R-0001

DEFENSE ADVANCED RESEARCH PROJECTS OFFICE (DARPA)

DARPA/DEFENSE INFORMATION SYSTEMS AGENCY
JOINT PROGRAM OFFICE (D/D JPO)
3701 NORTH FAIRFAX DRIVE
ARLINGTON, VA. 22203-1714

DEFENSE AIRBORNE RECONNAISSANCE OFFICE (DARO)

4 MARCH 1997

MEMORANDUM FOR TACTICAL COMMON DATA LINK (TCDL) BIDDERS

DATE: 4 March 1997

SUBJECT: TCDL Program Solicitation

The Defense Advanced Research Projects Agency (DARPA), in conjunction with the Defense Airborne Reconnaissance Office (DARO), is pleased to offer you the opportunity to respond to the TCDL solicitation. We are pleased at the depth and scope of your wide range of questions and comments on our draft solicitation. The final solicitation you will see is substantially revised because of you.

Our objective for this TCDL acquisition remains the same, however. DARPA/DARO wishes to develop a family of digital data links that are CDL interoperable, low-cost, reliable, tailored to size, weight, and power (SWAP) requirements, and have the capability to support a wide range of intelligence, surveillance and reconnaissance (ISR) applications. The Government is seeking participants in this program that are capable of developing and demonstrating the fundamental technologies required to achieve the capabilities described in this solicitation and is capable of producing them in quantities to meet various government needs. Offerors have the flexibility to use business and technical practices which demonstrate the best value to the Government.

This solicitation will lead to approximately three (3) agreements awards using the authority of Section 845 in the 1994 National Defense Authorization Act (P.L. 103-160), as amended by Section 804 of the 1997 National Defense Authorization Act (P.L. 104-201). Section 845 agreements, otherwise known as other transaction agreements for prototype projects, reduce the traditional administrative burden and oversight created under government contracts. Included in the solicitation is a model agreement for Offerors' use in developing an agreement for inclusion in your proposal.

The solicitation revisions have also generated revisions to our requirements and goals (Attachment A), objectives, and milestones. Proposal preparation instructions have also been revised to provided a clearer definition. We hope these revisions have addressed your concerns. We have addressed in the solicitation our complete program and plans including the down-selection process for Phase 2. This is our plan and we are expecting you to tell us in your proposal the feasibility and appropriateness of this plan based upon your concepts and best ideas.

We look forward to your participation in this new and innovative approach to addressing the Government's requirement. Should you not be successful in receiving an award, this process should prove to be enlightening and meaningful for your future endeavors.

ALGERIA K. TATE
Contracting Officer
CONTRACTS MANAGEMENT OFFICE

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ATTACHMENTS

PROGRAM SOLICITATION

Tactical Common Data Link (TCDL) Program

Notice: Proposals are due by April 4, 1997 at 2:00 PM to Ms. Algeria Tate, Contracting Officer, Defense Advanced Research Projects Agency (DARPA), 3701 North Fairfax Drive, Arlington, VA 22203-1714.

1.0 General Information

The Defense Advanced Research Agency (DARPA)/Defense Information Systems Agency (DISA) Joint Program Office (D/D JPO) and the Defense Airborne Reconnaissance Office (DARO) are planning a technology development and demonstration program leading to a Tactical Common Data Link (TCDL). This program will be executed under the authority of Section 845 the 1994 National Defense Authorization Act (P.L. 103-160), as amended by Section 804 of the 1997 National Defense Authorization Act (P.L. 104-201). Other transactions for prototype project provides for the "acquisition of prototype projects" and allows considerable flexibility in the acquisition process. This procedure is being used to maximize industry participation in the TCDL design and to encourage the most creative, open, and extensible design concepts.

The objective of the TCDL acquisition is to develop a family of digital data links that are CDL interoperable, low-cost, reliable, tailored to size, weight, and power (SWAP) requirements, and have the capability to support a wide range of intelligence, surveillance and reconnaissance (ISR) applications. Overall program objectives are to:

- Develop a family of CDL compatible digital data links to support radar, imagery, video, and SIGINT
- Support manned and unmanned programs, including Outrider, Predator, Pioneer, P-3 Family, Rivet Joint, Joint STARS, ARL, Guardrail, and ATARS
- Interoperate with the current CDL system (10.71 Mbps return link, 200Kbps command link)
- Emphasize an open architecture

Requirements for the TCDL design are that it interoperate with existing CDL systems and the tactical control system (TCS), which is under development, and support SWAP requirements of Outrider and Predator TUAVs. Beyond these basic requirements, the goals for the TCDL are affordability, scalability to support future manned and unmanned members of the TCDL family, and flexibility and expandability to include desirable enhancements, such as air-to-air data communications links, airborne communications relay, terrestrial line-of-sight (LOS) microwave

communications, and other applications requiring LOS and data communications at rates up to 45Mbps.

The Government will award approximately three (3) agreements which represent the best value to the Government in accordance with the evaluation criteria. D/D JPO and DARO are seeking participants in this program that are capable of developing, demonstrating, and manufacturing the fundamental technologies required to achieve the capabilities described in this solicitation. Offerors have the opportunity to be more creative in designing the TCDL and in the selection of the technical and management processes, either commercial or DOD practices, that best suit their TCDL team.

To reduce the traditional administrative burden and oversight of Government contracts, the D/D JPO plans to use an innovative type of agreement – one not generally subject to the normal Federal procurement laws and regulations – known as an "other transaction for prototypes". This type of agreement allows a great deal more flexibility and has far fewer regulatory requirements than a typical Federal Acquisition Regulation (FAR) contract. In particular, this initiative will not generally require Government cost accounting standards nor Government cost audits. Furthermore, intellectual property provisions may be negotiated that differ from those usually found in procurement contracts. The Government intends to share information and data throughout the program. However, this data will always be advisory, not directive in nature, and offered as a way to foster better communications on the TCDL program. The intent is to provide the best possible insight into what the Government thinks while minimizing oversight. The Government is seeking the most capable system within the affordability goals. Offerors are expected to do the trade-off analyses and convince the Government that it can be done.

The Government expects to fund each agreement awarded in Phase 1 with $1 million. Following the down-selection process at the end of Phase 1, the Government expects to fund each Phase 2 agreement approximately $6 million. In addition to the Government funding, contractor cost sharing is encouraged. Many contractors receive Government-reimbursed funds for independent research and development (IR&D). DARPA intends to use "other transactions for prototypes" for this effort that will allow the use of IR&D funds on the offeror's share of costs (see FAR 31-205.18(e)).

Funding under this type of agreement will be based on "payable milestones." These are significant, observable technical events that the offeror and the Government agree in advance will be the basis for incremental payments making up the Government's share of expenditures. This approach tends to be fairly flexible, and milestones may be changed during the course of the project. If the costs to complete exceeds the amount initially agreed to, then the offeror must either absorb the costs or may choose – as the "other transaction" prototyping agreement will permit – to discontinue the project.

The information provided in this program description and solicitation constitutes the Government's technical requirements, evaluation factors for award, and proposal instructions. Offerors are encouraged to visit the TCDL home page located on the World Wide Web (WWW) at URL address http://www.les.mil/ and review documentation provided at the WWW site and the

TCDL reading room located at Adroit Systems, Inc., 209 Madison Street, Suite 511, Alexandria, VA 22314-1764.

2.0 TCDL Technical Requirements and Goals

2.1 Introduction

The objective of the TCDL acquisition is to develop a family of digital data links that are CDL interoperable, low-cost, light weight, and have capability to support a wide range of Intelligence, Surveillance and Reconnaissance (ISR) applications. The initial TCDL design, and the subject of this solicitation, is the Tactical Unmanned Aerial Vehicle (TUAV) TCDL. The TCDL is targeted for unmanned aerial vehicle applications (e.g., Predator and Outrider). In the future TCDL design is expected to be extended to additional manned and unmanned applications (e.g., Guardrail, Rivet Joint, P3 family, ARL and Joint STARs (JSTARs)). The TCDL will operate in Ku band and will be interoperable with the existing CDL equipment at the 200 Kbps forward link and 10.71 Mbps return link data rates and is expected to interface to the Tactical Control System (TCS). In addition the TCDL is expected to be capable of operation in other frequency bands and operate with variable forward and return link data rates. The program will use a modular, open systems architecture approach, commercial off-the-shelf (COTS) components, and industry-standard interfaces to the maximum extent possible. The TCDL design has the potential for applications beyond the scope of the initial TCDL concept. Although such applications are beyond the scope of the TCDL development acquisition, with appropriate advance planning in the design phase (e.g., the development of a symmetrical transmission capability), the TCDL could be readily modified to support other applications such as the following:

- Air-to-air data communications links (i.e., to support the Guardrail program and similar applications)
- Airborne communications relay (i.e., to support the Airborne Communications Node (ACN) program)
- Terrestrial Line of Sight (LOS) microwave communications requirements
- Other applications requiring LOS data communications at rates up to 45 Mbps

2.2 Scope

The TCDL acquisition will be a two-phase, multiple award, competition to obtain multiple design studies in Phase 1, with a subsequent down-selection to build, test, and demonstrate prototype development units in Phase 2. Phase 3, which is beyond the scope of this acquisition, contemplates the military services acquiring quantities of TCDL equipment for use on Outrider or Predator, or for requesting TCDL modification to meet other application needs.

2.3 The TCDL Acquisition Program

The TCDL acquisition program is an attempt to acquire more than just a "stove pipe" data link that meets the current requirements of a few users. It is an attempt to develop an architecture that supports current and future requirements of many users. In order to accomplish this, it is important to focus on an architectural approach that allows for change. The government believes that the best architectural approach will be defined by a set of interfaces, both functional and physical, that promotes modular software and hardware that can be implemented through the application of industry standards and commercial-off-the-shelf components. In order to accommodate current and future requirements, the architecture must possess the following qualities:

- Flexibility: The ability to quickly and easily change attributes to accommodate varying user and mission requirements, such as the capability to change sensor inputs during flight
- Expandability: The ability to add new features and functions without system redesign
- Scalability: The ability to shrink or grow the system capabilities to accommodate bigger or smaller requirements, such as increasing the range or bandwidth
- Modularity: The ability to change the systems attributes by physically changing modules (hardware and/or software), such as changing interface modules to accommodate different sensors

2.4 Phase 1 Objectives (Architecture and Design Definition Phase)

Phase 1 is expected to be completed within six months of the Phase 1 award. During this phase, the objective is to develop a TCDL airborne and surface terminal equipment design for TUAV applications (e.g., Predator and Outrider). The design is expected to be scaleable to additional manned and unmanned ISR systems and applications.

Specific design objectives are outlined in Attachment A (TCDL Technical Requirements and Goals). This attachment outlines a set of requirements that is expected to be incorporated in the TCDL design. In addition, Attachment A specifies a set of design goals that the Government would like the contractor to consider incorporating in the TCDL design. The target design must meet all the TCDL technical design requirements and as many of the TCDL technical design goals as feasible and practical. The contractor is to perform tradeoff analyses to demonstrate the feasibility and practicality of incorporating TCDL design goals. The following list summarizes the general TCDL Phase 1 objectives:

- Develop an airborne and surface terminal design that is applicable for various TUAV applications (i.e., Outrider and Predator) and addresses the requirements and goals stated in Attachment A
- Develop the airborne/surface terminal design such that it is scaleable for use on other ISR platforms (e.g., Guardrail, Rivet Joint, P3 family, ARL and JSTARs)

- Develop the airborne and surface terminal design that will meet production cost goals stated in Attachment A
- Provide a proof of concept demonstration that conveys the contractors approach for mitigating high technical risk areas.

2.5 Phase 1 Milestones and Deliverables created by the Government.

If the Offeror believes revisions are needed to better support this program, they should make revisions in their agreement and discuss the rationale in the proposal (Technical Approach).

Milestone 1: Phase 1 Kickoff (proposed payment of $100,000 upon successful completion of the milestone)

- Updated program plan

Milestone 2: Mid-Phase 1 (proposed payment of $300,000)

- Documentation of preliminary design, including:
  - Approach to achieving CDL interoperability and SWAP requirements
  - Approach to open systems architecture
  - Approach to achieving proposed goals
  - Tradeoff analyses providing the rationale for the selected design
  - Proof-of-concept demonstration plan
- In-process review (IPR)

Milestone 3: Proof-of-Concept Demonstration (proposed payment of $400,000)

Milestone 4: End of Phase 1 Design Activity (proposed payment of $200,000)

- Detailed system design including:
  - System architecture including interface definitions
  - Implementation of proposed functional capabilities
  - Hardware and software description
- Description of flexibility, expandability, scalability, and modularity features
- Final proof-of-concept demonstration report

2.6 Phase 2 Objectives (Implementation & Testing Phase)

Phase 2 is expected to be completed within 18 months of Phase 2 start date. During Phase 2 each contractor shall build, test, deliver and support five (5) TCDL airborne terminals and one TCDL surface terminal in accordance with their Phase 1 design.

The TCDL airborne and surface terminals should be capable of being installed on either Outrider or Predator UAVs as well as manned airborne platforms and ground control systems for testing and demonstrations. The Government plans to specify the TCDL demonstration aircraft and surface stations at the completion of Phase 1.

2.6.1 Phase 2 Testing

The TCDL airborne and surface equipment will be tested under laboratory and flight test conditions to ensure compliance with the description of design submitted under Milestone 4. The contractor is expected to accomplish laboratory testing of the TCDL equipment at the contractor's facility to demonstrate compliance with the design specification. The Government can provide access to a CDL channel simulator, which is located at the Defense Advanced Research and Development Agency (DARPA), Arlington VA. The Government will provide access to a fully capable Government-owned CDL testbed at a location to be determined. Interoperability shall only be validated on a fully capable CDL testbed.

The contractor is expected to demonstrate compliance with TCS interfaces with the Tactical Control System (TCS), which is still under development. TCS interoperability will be demonstrated at a TCS laboratory facility at either the System Integration Lab, Huntsville, Alabama, the Navy Surface Weapons System, Dahlgren, Virginia, or at another CONUS facility that the Government will designate.

The contractor is expected to participate in a flight demonstration readiness review prior to flight testing. In preparation for this review the contractor must provide sufficient technical information to the Government, including the results of the laboratory acceptance testing, and any other reports or documentation to support flight readiness. In addition, the contractor is expected to deliver a comprehensive flight demonstration plan. The Government will provide access to flight test range with a CDL test/operational asset within the Continental United States (CONUS) for the contractor to demonstrate system compliance with the TCDL Technical Requirements and Goals Document including CDL interoperability. The flight demonstration phase is expected to be limited to six months and is included within the overall 18 month duration of Phase 2. During this phase, the contractor is expected provide support for TCDL flight demonstration operations at a continental United States location(s).

2.6.2 Notional Phase 2 Milestones and Deliverables

<u>Milestone 1: Phase 2 Kickoff</u>

- Updated program plan

<u>Milestone 2a, 2b, 2c … Proposed by Contractors at end of Phase 1</u>

- Test plan for laboratory testing
- Additional Contractor proposed deliverables

<u>Milestone 3: Laboratory Testing</u>

- Functional tests
- Interoperability tests
- Test report (description and results)
- Flight demonstration plan

Milestone 4: Flight Demonstration

- Flight worthiness review (and acceptance by Government)
- Flight demonstration
- Flight demonstration report (description and results)

Milestone 5: End of Phase 2

- System delivery (5 airborne terminals, 1 surface terminal per contractor)
- Description of final design
  - Drawings
  - Description
- Production pricing estimates
- Plan for transition to production and operation

2.7 Program Management

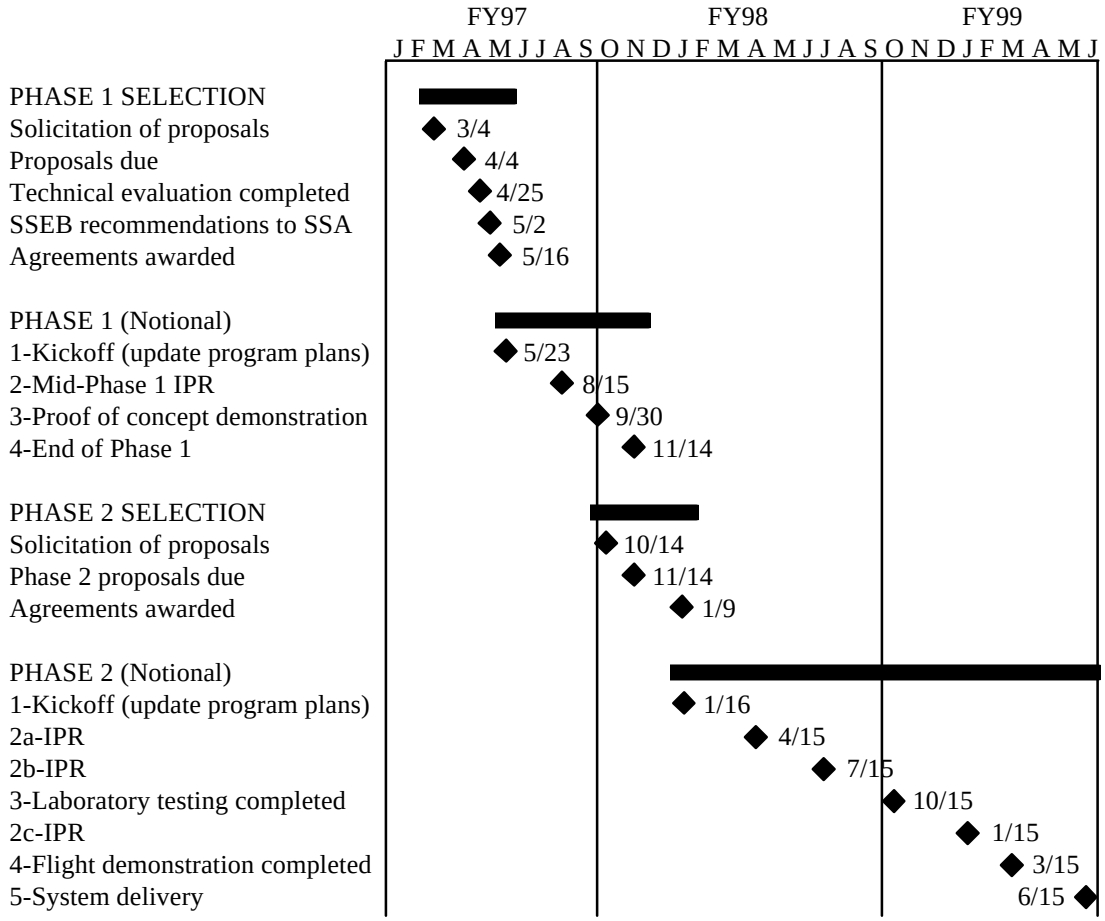
The contractor is expected to provide the necessary management to execute this program. This includes, managing the program as well as preparing, conducting and documenting program reviews to keep the Government informed of overall program status. Each TCDL Offeror is expected to form an Integrated Product Team (IPT). The D/D JPO Program Manager will select the Government representative to facilitate the flow of information between the Offeror and the Government. The Government member may be a non-voting member of the source selection process for the Phase 2 down-selection. Phase 1 contractors may also include team representatives from other contractor organizations, such as those building Outrider, Predator, or TCS systems, or other government organizations, as they deem appropriate or necessary to meet TCDL design goals. The D/D JPO Program Manager desires an open and continuous dialog with the individual contractors. The purpose of this dialog is to have insight, not oversight, into the contractor's design activities and approaches. Therefore, the Offeror is expected to provide access to appropriate D/D JPO personnel the documentation necessary to have visibility into the technical progress, schedule, management and financial status, and any other documentation required to execute this program. How the Government personnel will interact with the contractors will be the subject of Rules of Engagement which will be provided at time of award. The instructions presented in this section have been tailored to the evaluation factors to be applied during the proposal evaluation. The overall quality of the proposal will be considered a direct indication of the Offeror's capability to comply with the solicitation requirements, to include

technical and managerial competence, expected quality of deliverables, and cost reasonableness. These instructions are designed to ensure the submission of information essential to the understanding and comprehensive evaluation of the Offeror's proposal.

2.8 Government's Notional Program Plan and Schedule of Events

A notional program plan and schedule of events for the TCDL program is shown below. The Offeror's proposal should include proposed a schedule, observable technical accomplishments, deliverables, and payable milestones.

Figure 1. Notional Program Plan and Schedule of Events



3.0 Proposal Preparation Instructions

3.1 General Instructions

The instructions presented in this section have been tailored to the evaluation factors to be applied during the proposal evaluation. The overall quality of the proposal will be considered a direct indication of the Offeror's capability to comply with the solicitation requirements; and to include technical and managerial competence, expected quality of deliverables, and cost reasonableness. These instructions are designed to ensure the submission of information essential to the understanding and comprehensive evaluation of the Offeror's proposal.

3.2 Submission of Offers

Five (5) paper copies (one signed original), and two diskette copies of the proposed agreement must be submitted to the address cited at the top of this solicitation. Offers received after the exact time specified will not be considered. Proposals submitted by facsimile or electronic mail will not be evaluated. It is anticipated that multiple awards will be made. All responsible U.S. businesses may submit. Research centers, Universities, and Historical Black Colleges and Universities (HBCU) and Minority Institutions (MI) are encouraged to join others in submitting proposals. However, no portion of this solicitation will be set aside for HBCU and MI participation due to the impracticality of reserving specific areas of TCDL technology for exclusive competition among those entities.

3.3 Period for Acceptance of Offers

The Offeror is expected to validate the prices in its offer for 90 calendar days from the date specified for receipt of Proposals.

3.4 Formal Communications

This solicitation, Question and Answer file, and other related documents can be found on the Internet home page (http://www.les.mil/) and at the TCDL Reading Room. Questions should be directed to Ms. Algeria Tate, DARPA, Contract Management Office, 3701 North Fairfax Drive, Arlington, VA 22203, via electronic mail message to atate@darpa.mil, or by facsimile to 703-696-2208. Each question and comment must reference the solicitation number.

3.5 Participation of Government Support Contractors

Offerors are advised that employees of Adroit Systems Inc. and The MITRE Corporation have been identified as technical advisors in the Source Selection process. These individuals have signed Non-Disclosure statements and will be authorized access to only those portions of the proposal data and discussions that are necessary to enable them to perform their respective duties. Such firms are expressly prohibited from competing on the subject acquisition and from proposal scoring, ranking, or recommending the selection of a source. By submission of your proposal, you agree that your proposal information may be disclosed to those selected individuals for the

limited purpose stated above. Any information not intended for limited release to these individuals must be clearly marked and submitted segregated from other proposal material.

3.6 Destruction of Unsuccessful Proposals

All unsuccessful proposals will be destroyed after three (3) months. No destruction certification will be furnished.

3.7 Instructions for Preparation of Proposals

Each proposal should address three general areas: (1) technical approach and product capability, (2) management processes (including personnel qualifications and past performance), and (3) cost. The proposal should not exceed 100 pages, including all appendices, attachments, figures and tables (the Agreement is not included in the page limitation). Offerors are encouraged to provide the necessary information in the fewest pages required to demonstrate their effort. Material exceeding the page limitation will not be evaluated. All proposals will be unclassified. Should submittal of classified information be required, the Offeror must contact the Contracting Officer for instructions.

Offerors must submit a draft agreement in accordance with the Model Agreement found at Attachment B. Complete Articles I (Scope), III (Task Description), and IV (Payable Event Schedule). These agreement sections are critical in the construction of the offeror's response and in the evaluation process. In addition, propose any changes, additions, or deletions to the Model Agreement that should be considered during negotiations. Fully explain the rationale for the changes made in an addendum to the Agreement.

Table 1. Response Format and Page Limitation

Sections of Proposal	Notional Page Recommendation
Table of Contents	1
Executive Summary	5
Technical Approach	30
Product Capability Description	30
Management	30
Cost Response	3
Acronyms, etc.	1
Model Agreement	No Limitation

Five (5) copies of proposals will be submitted in loose-leaf form and tabbed to indicate section changes. Pages will be single-spaced, single-sided, on 8-1/2 x 11 inch paper. All pages will be numbered consecutively. The offeror should use a uniform paragraph numbering system; each paragraph and subparagraph should have a separate identifier. Offerors will use 12 point or larger

type fonts for textual material, including footnotes. Condensed printing, small type faces, slight margins, highly reduced figures, etc., are unacceptable.

Legible graphics (e.g., figures, tables, charts, etc.) should be used where appropriate and practical to depict organizations, processes, system descriptions and designs, implementation schedules, plans, etc.

Electronic proposal submissions will be in uncompressed files submitted on 3.5 inch double-sided/1.44 MB IBM PC-formatted diskettes. Layout of the proposal text in Graphics (such as Text Art, Text Box, etc.) or Columns (such as Newspaper, Balanced Newspaper, Parallel, etc.) are not permitted

3.8 Proposal Breakout

The offeror is expected to present the proposed technical and management approach for accomplishing the work required by the solicitation. Each response should be keyed to the respective Solicitation paragraph and include a description of how the requirement will be satisfied in enough detail to allow evaluators to determine that the requirements will be met or exceeded. The following general guidelines are provided for the development of proposals.

- The proposal should include a cover page with the title of the proposal, name and address of proposing organization (including each participant of a multiple-entry team), and the name, title and telephone numbers, and electronic mail addresses, if any, of technical and administrative contacts. An official letter of submission, signed by a corporate officer having the authority to commit the company, should follow the cover page.
- The offeror is expected to demonstrate a clear understanding of the requirements and goals and to substantiate the soundness of the proposed approach. Any risks associated with satisfying the requirements and goals should be identified, and the likelihood that the proposed approach will succeed in the presence of those risks must be demonstrated.
- The proposal should include specific references to substantiating documentation. Appropriate technical documentation used as references may be delivered along with the proposal. It is the offeror's responsibility to assure that all documentation needed by the evaluation team to thoroughly understand and evaluate the proposal is available. This documentation may be provided as a part of the proposal, and will be included in the page limitation.

3.8.1 Technical Approach

The technical proposal should provide a preliminary description of the technical approach to be used in delivering the proposed design. Specifically, the technical approach section should include the following:

- Describe the technologies, architecture, interfaces, standards, and methods or techniques to be used in the proposed design. The offeror should describe how the proposed design meets the goals of open systems architecture, modularity, and the use of COTS and industry standard interfaces.
- The proposal should discuss any innovative claims, should identify key technical ideas to be pursued, and should describe the expected impact on the state of the art and benefits to end users. This should include the technical rationale substantiating claims made, a description and justification of proposed work, and a comparison with alternative approaches.
- The offeror should discuss how the proposed design will be developed, built, tested, and demonstrated. This section should describe how technical skills and physical resources, such as laboratories, manufacturing and test facilities, and other resources will be used to assure the successful completion of the program deliverables.
- The technical proposal should identify and discuss in detail the tests and demonstrations to be performed, including laboratory tests, the proof-of-concept demonstration at the end of Phase 1, and the flight demonstration in Phase 2. The initial proposal should provide a detailed plan for the design and proof-of-concept demonstration activities of Phase 1. The initial proposal also should provide a proposed approach for the production, testing, and flight demonstration activities in Phase 2.
- The proposal should include the expected results from the design effort, and the form in which the results will be available to influence the research, development, and practice of others. This should describe how the expected results could be integrated with solutions other contractors are likely to develop, so as to achieve systematic approaches to larger capabilities and applications. The offeror should provide a summary of any proprietary claims of results, prototypes or systems, or a statement of no proprietary claims. Offerors are advised to read Articles VIII (Patent Rights) and IX (Data Rights) of the Model Agreement (Attachment B).

3.8.2 Product Capability Description

The proposal is expected to include a detailed discussion of the proposed design in terms of its features, functions, and capabilities, and how these capabilities will be achieved. In general, the product capability description should describe what the proposed design will do and how it does it. Specifically, this section should include the following information.

- Describe the proposed system design and how it will satisfy the interoperability and SWAP requirements in Attachment A. The proposal should include a preliminary description of the proposed airborne and surface terminal designs and how they will support Outrider and Predator, and how it will interoperate with CDL systems and the Tactical Control System, which currently is under development.
- Describe which of the affordability, flexibility, expandability, scalability, and modularity goals described in Attachment A the design will support. The proposal

may include a risk assessment of any technical barriers to be overcome, and should describe the technical developments which will surmount those barriers and the basis for confidence that those developments are feasible.

- The proposal also should discuss any requirements or goals that will not be included in the design, and the reason for their exclusion (e.g., cost or limits of technology).

3.8.3 Management Processes

The proposal is expected to include a discussion of the management processes that describes how proposed personnel, organizational structure, and management procedures will provide the overall program control and expertise to meet requirements and goals. It should address the coordination and tracking of program progress, schedule, and expenditures, including a discussion of the documentation to be made available to the Government and the Government's visibility into the contractor's development processes and progress. The proposal also should address subcontracting and teaming arrangements, lines of authority, areas of responsibility, assigned task areas, and the rationale for teaming selection. The following additional guidance is provided:

- Describe the proposed schedule, observable technical accomplishments, deliverables, and payable milestones. This should include performance metrics indicating how the development would be evaluated objectively. A summary of the deliverables is expected to be more substantive than a report or journal article (e.g., prototype hardware or software, algorithms, or performance data).
- Provide a list of key personnel (e.g., lead or senior engineers, and program managers) and estimated level of effort in staff months for each task and phase of contract performance. Provide a concise summary of qualifications of key personnel, including resumes. Each resume submitted shall be validated by the signatures of the individual and an officer of the company.
- Provide a list of related projects and proposals pending award to which key personnel are assigned or proposed, and a discuss how the Offeror will be able to meet proposed personnel commitments and satisfy all clients.
- The proposal also should convey evidence that the offeror, or the offeror's team, has the capability to perform all phases of the TCDL program, including any follow-on production activities.
- Offerors are expected to explain the results of other contracts that are relevant to their proposal in terms of achieving desired product performance within schedule and cost, and risk reduction efforts and lessons learned. If classified information is to be submitted in order to substantiate the Offeror's claims, the offeror must contact the Contracting Officer for instructions at least five (5) working days prior to the proposal submittal due date.
- The Offeror should address its proposed IPT structure and management, including processes, procedures, membership, and decision-making, etc.

3.8.4 Cost Response

The cost proposal defines labor necessary to do the job, and any cost share (by amount and type). The cost response is expected to include, at a minimum, the information necessary to determine the reasonableness of cost. The cost response will be in the Offeror's format and address Phase 1.

DARPA anticipates funding $1 million for Phase 1. Certified cost or pricing data are not required; however, in order to determine the reasonableness, realism and completeness of your cost proposal, provide the following:

- Labor: Total labor includes direct labor and all indirect expenses associated with labor, to be used on Phase 1 of the TCDL program. Provide a breakdown of labor and rates for each major category of personnel to be used during Phase 1.
- Direct Materials: Total direct materials include materials that will be acquired and/or consumed in the performance of Phase 1. Limit this information to major items of material and how the estimated expense was derived.
- Subcontracts: Describe major efforts to be subcontracted, specifying the source, estimated cost, and the basis for the estimate.
- Travel: Total proposed travel expenditures relating to Phase 1. Limit this information to the number of trips and purpose of each.
- Other Costs: Any direct costs not included above. List the item, estimated cost, and the basis for the estimate.
- Government Provided Resources: The Government may provide equipment, technical assistance, or services as part of the project. Examples of this include engineering advice and the use of Government test equipment. Do not include the internal Government costs of these resources in your cost calculations. In those cases where there is an exchange of funds–for example, if the offeror has to pay for the use of a Government test facility–those funds will be an appropriate part of the cost response.

4.0 Proposal Evaluation Process

All proposals received will be reviewed and evaluated. The proposals will be evaluated solely on their general merit, compliance with program requirements and other factors. The specific areas of evaluation are: technical approach and product capability, management processes (including personnel qualifications and past performance), and cost. These areas are not equally ranked. The Government reserves the right to award without discussions.

4.1 Basis for Phase 1 Award

For Phase 1, the technical approach and product capability is approximately twice as important as management processes (including personnel qualifications and past performance). The cost response is less important than either the technical approach or the management processes. The evaluation factors and subfactors applicable to performance in Phase 1 are as follows.

4.1.1 Technical Approach and Product Capability Description

The following factors will be used to review and evaluate the technical approach and product capability description:

- The degree of innovation and ingenuity in the application of technologies, architecture, interfaces, standards, and methods or techniques
- The reasonableness of proposed development, construction, testing, demonstration, and prototype manufacturing approaches
- Whether the technical approach and product capability description achieves the requirements described in Attachment A
- The degree to which the technical approach demonstrates the potential to meet the affordability goals for TCDL production
- The degree to which the technical approach achieves some or all of the flexibility, expandability, scalability, and modularity goals described in Attachment A

4.1.2 Management Processes

The following factors will be used to review and evaluate the management processes:

- Management processes
  - Proposed management of the Contractor's IPT, subcontractors, and associated contracts
  - Demonstrated capability to track and manage program progress, schedule, and expenditures
  - Accurate and timely documentation that allows the Government to monitor all aspects of the program
- Qualified personnel
  - Specific related experience in the technology areas
  - Related IR&D efforts
  - Experience in developing airborne electronics or communications links
- Past Performance
  - Projects of similar relevant technology, complexity, and size

- Demonstrated accomplishments, lessons learned, and the technical and cost tradeoffs made in the execution of recent or on-going projects using similar technologies

4.1.3 Cost Response

The cost review will focus on the offeror's realism, reasonableness, and completeness of the Phase 1 cost. An area of consideration will be the extent to which the amount of effort proposed for Phase 1 correlates to the proposed cost in such a way to ensure the Government is receiving adequate value, and the degree of cost sharing proposed by the Offeror.

4.2 Down-Selection Factors for Phase 2 Award

Near the end of Phase 1, the Government will solicit detailed proposals from Phase 1 contractors for work to be accomplished in Phase 2. The Government will review and evaluate the Phase 2 using the down-selection factors outlined below to determine which Phase 1 contractors will receive the award for Phase 2. The Phase 2 awards will be made by agreement modification. While the down-selection factors are subject to change, the Government will endeavor to inform contractors selected for award of Phase 1 of any planned changes as early as possible.

The down-selection factors to be considered in selecting the Phase 2 contractors include all of the factors in the initial proposal, plus the following additional factors:

- Contractor performance during Phase 1, considering the timeliness and quality of the deliverables
- Equipment test and demonstration effort was sufficient to validate the requirements
- Risk areas were identified and minimized, resulting in a low-risk TCDL design
- Use of any unique parts or proprietary technology does not prevent the use of an open systems architecture

4.3 Notification of Phase 2 Selections

Selected contractors shall not proceed with work under Phase 2, however, until notified by the Contracting Officer. Notification may be verbal followed by written modification to the agreement to exercise Phase 2. Only the Contracting Officer has the authority to notify contractors of the Government's intent to exercise the agreement for Phase 2.

5.0 Oral Presentations

The Government does not intend to conduct oral presentations during the Phase 1 solicitation.

6.0 Late Proposals

No proposal received after the stated date and time will be considered unless:

- It was sent by registered or certified mail on or before March 31, 1997 or by U.S. Postal Service Express Mail Next Day Service-Post Office to Addressee on or before 3:00 PM at the address of mailing on April 2, or
- It was sent by mail and its late receipt is determined by the DARPA Contracting Officer to be due solely to mishandling by the Government after receipt at the address specified in this solicitation.

The only acceptable evidence to establish the mailing date of a late proposal or modification sent either by Express, registered, or certified mail is the U.S. Postal Service postmark both on the original receipt and the envelope or wrapper. All postmarks must show a legible date or the proposal will be processed as if mailed late. Proposals sent using private express services must be received by the deadline.

7.0 Regulations Governing Objections to the Solicitation and Award

Any objections to the terms of this solicitation or to the conduct or receipt, evaluation, or award of agreements must be presented in writing within ten (10) calendar days of (1) the release of this solicitation, or (2) the date the objector knows or should have known the basis for the objection. Objections should be provided in letter format, clearly stating that it is an objection or protest to this solicitation or to the conduct of evaluation or award of an agreement, and providing a clearly detailed factual statement of the basis for the objection. Failure to comply with these directions is a basis for summary dismissal of the objection. Mail objections to Contracting Officer at the address specified for delivery of proposals in response to this solicitation.

ATTACHMENT A

TACTICAL COMMON DATA LINK

TECHNICAL REQUIREMENTS AND GOALS

A1.0 Introduction

This document presents a system level introduction to the requirements and goals for the Tactical Common Data Link (TCDL) communications system architecture. The information contained in this document should be considered as the minimum capabilities, services, interfaces, performance, and operation associated with the TCDL. It is not intended to define or specify how the TCDL system architecture should be implemented.

The TCDL communications system is a full-duplex, point-to-point, Line-of-Sight (LOS), microwave communications data link intended for use in imagery and signals intelligence collection systems. TCDL will provide near-real-time connectivity and interoperability between multiple TCDL collection platforms, TCDL surface terminals, and currently fielded Common Data Link (CDL) interoperable systems operated by the armed services and Government agencies. It is expected that the TCDL will provide a family of equipment targeted initially for use on Tactical Unmanned Aerial Vehicles (TUAVs) and scalable for use on other UAVs and manned aircraft.

The TCDL configuration will be controlled by the CDL Program Office under the direction of the Defense Airborne Reconnaissance Office (DARO). CDL interoperability is achieved by specifying the CDL waveform (radio frequency (RF) and digital) characteristics, controlling and coordinating hardware configurations, and careful management of pre-planned product improvement and technology insertion efforts. In addition to providing interoperability among CDL equipment elements, CDL provides backward compatibility with the widely deployed Interoperable Data Link (IDL) family of systems.

TCDL is composed of two subsystems, the airborne terminal located on board the intelligence collection platform, and the surface terminal located on the earth's surface, which typically is used in conjunction with the user data exploitation facility. Users are defined as those who employ the services of the data link. User equipment is that equipment provided by the user that may or may not interface with the data link.

A1.1 Scope

This document contains both technical requirements and technical goals. The technical requirements are defined as those attributes of the TCDL design that are necessary to meet the overall program objectives, and are specified to ensure that TCDL is compatible with current UAV systems, interoperable with existing CDL systems and the Tactical Control System, and meets the form, fit, and functions for TUAV operation. The technical goals are extensions of the requirements that would enhance the TCDL capabilities. The optimal TCDL system design will meet all of the TCDL requirements and will fulfill as many as the goals as is feasible and practical.

A1.2 References

In order to complete this task, it will be necessary for the contractors to have a thorough understanding of various UAV platforms and systems as well as the current CDL specifications. The Government has facilitated this by establishing a reading room containing the appropriate technical information. Detailed information regarding reading room location, operating procedures and bibliography has been furnished as a separate document. In addition to the reading room, the Government has established an Internet home page (http://www.les.mil/), which has a limited amount of reference material and other programmatic information.

A2.0 TCDL System Concept of Operations (CONOPS)

The CONOPS described in this section is provided as a guide for developing the TCDL architecture and is not meant as a finalized CONOPS for TCDL. The TCDL CONOPS has been developed to provide better connectivity between current and future reconnaissance aircraft under DARO oversight. It is the desire of DARO to develop a digital LOS communications architecture for the Outrider and Predator UAVs and the Tactical Control System (TCS) that is CDL interoperable, is scalable for other platforms, and is modular in construction so that, as new sensors and users are introduced, the system architecture can accommodate them without a complete restructuring of the data link.

The TCDL architecture is expected to employ as much commercial off-the-shelf (COTS) hardware as practical and is expected to utilize an open systems architecture. The level of modularity, utilization of COTS, and application open systems is to be developed and specified by the contractor.

The TCDL communications system provides a full-duplex, digital transmission between intelligence collection platforms and surface terminals by means of point-to-point or LOS transmissions. It is intended that the TCDL airborne terminal receive a spread spectrum command link. The command link rate will be at the CDL 200 Kbps data rate with the capability of embedding the Predator UAV command link rate of 64 Kbps. In addition, the airborne terminal will transmit the CDL low-rate 10.71 Mbps return link rate that can be received LOS by a TCDL surface terminal, a CDL surface terminal, or a Remote Video Terminal (RVT).

A3.0 Technical Requirements

This section describes the requirements for the TCDL design. The contractor is encouraged to be innovative in developing the TCDL design in accordance with the requirements.

A3.1 Common Data Link Interoperability

The TCDL airborne and surface terminals must be interoperable with existing CDL systems as specified herein. In the CDL interoperable mode of operation, the narrowband multiplexing,

waveform, and external interfaces must adhere to the CDL specification as described here. The narrowband mode is defined as the 200 Kbps command link rate and the 10.71 Mbps return link rate. CDL interoperability is defined in the CDL Segment Class 1 system specification (Specification No. 7681990).

A3.1.1 Operating Frequency

The TCDL return link must be designed to operate in the 14.40 to 14.83 GHz band, and the forward link must operate in the 15.15 to 15.35 GHz band. The TCDL is required to be tunable in 5 MHz step sizes or less, as defined in the CDL specification.

A3.1.2 Command Link Data Rate and Modulation

The command link data rate is 200 Kbps and is allocated in accordance with the CDL specification. The modulation is required to be direct-sequence spread-spectrum binary phase-shift keying (BPSK) modulation. The minimum requirement for TCDL equipment is to incorporate three different pseudo-noise codes.

A3.1.3 Return Link Data Rate and Modulation

In accordance with CDL interoperability requirements, the return link rate is required to be 10.71 Mbps. The modulation will be Offset quadrature phase-shift keying (O-QPSK).

A3.1.4 System Bit Error Rate

The link is required to deliver a 10.71Mbps throughput with a bit error rate (BER) performance of 10^{-6} or better at the output of the communications security (COMSEC) device. Therefore, the contractor must take into account the COMSEC performance limitations and deliver a level of quality to the input of COMSEC device that will result in a 10^{-6} BER on the output.

A3.1.5 System Link Availability

The TCDL link availability is required to be equivalent to 90% availability in Crane Rain Model, region H.

A3.1.6 Multiplexing

The minimum TCDL return link multiplexing required is the Guardrail narrowband user channel multiplexing format, as defined in Table XVI in paragraph 3.2.1.2.5 of the CDL specification. The Interoperable Data Link (IDL) frame is not a requirement. The command link multiplexing is a requirement per the CDL specification.

A3.1.7 External Interfaces

The TCDL design must provide command and return link interfaces (electrical and mechanical) to support CDL interoperability. The return link external interface specified in the CDL specification is required to be those interfaces that are associated with the CDL narrowband interface employing the Guardrail user channel multiplexing format. (The standard CDL hierarchical return link multiplexing format is not required for TCDL.) The CDL narrowband interface includes the following:

- Prime Mission Executive Data (PMED) on the Guardrail Narrowband User Channel
- Executive Function Data (EFD) channel
- Navigation data channel
- Pilot audio channel
- Range data channel
- Synchronization channel

The command link external interface is defined in the CDL specification.

A3.1.8 Data Interleaving

The minimum command link requirement for TCDL is 1,024 symbols interleaving depth, Row/Column. The minimum return link requirement for TCDL is 4,096 symbols interleaving depth, Row/Random.

A3.2 Line of Sight Slant Range

The TCDL design goal for LOS slant range is 200 km at 15,000 feet above ground level (AGL); however the TCDL is required to operate at a slant range of 150 km AGL. The requirement is to maintain connectivity between the airborne terminal and the surface terminal during normal aircraft operations, except during outages due to air-frame blockage.

A3.3 Remote Video Terminal

The Outrider program has an operational requirement to receive video at multiple locations simultaneously. This implies that the associated return data link must be capable of operating in a broadcast mode. TCDL is required to provide this operational capability. To support this requirement, TCDL must include a broadcast mode to a receive-only surface terminal that is capable of receiving the TCDL return link and providing video (RS-170) and telemetry data outputs (i.e., a Remote Video Terminal (RVT)). The basic characteristics of the RVT are as follows:

- Operational LOS slant range of 20 km (goal is 40 km)
- Non-tracking antenna (manual pointing)

The contractor is required to demonstrate by analysis how their architecture and design will support the RVT capability and affordability goal. This analysis must include detailed design and cost information.

A3.4 Airborne Terminal Antenna

The contractor is required to provide an airborne antenna system that will support the UAV mission requirements. This includes the following:

- Line-of-site slant range requirement
- Link availability requirements
- Broadcast mode requirement to support RVTs
- Close in operation (Take-off and recovery of UAV's)

Multiple antenna solutions are acceptable (e.g., combination of omni-directional and directional). Should a directional antenna be proposed, the system must include the antenna, electronics to control the antenna for tracking and pointing, and the pedestal. UAV navigational data is available should it be required for antenna pointing. Exact antenna configurations will be defined by the contractor. The proposed configurations must be capable of being installed on Predator and Outrider UAV's and must be within the SWAP constraints.

The contractor is required to demonstrate by analysis how their architecture and design will support the RVT capability and affordability goal. This analysis must include detailed design and cost information.

A3.5 Airborne Terminal-to-Platform Interfaces

Paragraph A3.1.7 described platform independent data interfaces that are required for CDL interoperability. The TCDL design must also be capable of extending this basic CDL interface to specific platform sensors and command and control systems. The requirement for this acquisition is to provide interfaces to the sensors and systems on board the Predator and Outrider UAVs. The functions associated with these interfaces include physical interfacing (electrical and mechanical), multiplexing and demultiplexing data channels, and processing. Processing includes those functions required to interface to sensors that provide analog outputs (e.g., analog-to-digital conversion, and video and audio compression). When video compression is required, the method shall be Motion Picture Experts Group-2 (MPEG-2) compliant. The exact implementation for providing these functions will be contractor defined. It is not a requirement to provide the basic CDL-interoperable, Outrider, and Predator interfaces simultaneously. However, it is required that the attributes of the architecture and design allow TCDL to be easily reconfigured to support the requirements of the platform on which it is installed.

A3.6 Surface Terminal Interfaces

Paragraph A3.1.7 describes platform independent data interfaces that are required for CDL Interoperability. The TCDL design must also be capable of extending this basic CDL interface to specific surface platform processing and command and control systems. The requirement for this acquisition is to provide interfaces to the associated Predator, Outrider, and TCS ground control stations. The functions associated with these interfaces include, physical interfacing (electrical and mechanical), multiplexing and demultiplexing data channels, and processing. Processing includes those functions required to interface to processing and display equipment that require analog inputs (e.g., digital-to-analog conversion, video/audio reconstruction). When video reconstruction is required, the method shall be Motion Picture Experts Group (MPEG) 2 compliant. The exact implementation for providing these functions will be contractor defined. It is not a requirement to provide the basic CDL-interoperable, Outrider, Predator, and TCS interfaces simultaneously. However, it is required that the attributes of the architecture and design allow TCDL to be easily reconfigured to support the requirements of the surface terminal on which it is installed or associated.

A3.7 Airborne and Surface Terminal System Internal Interfaces

It is expected that both the airborne and surface terminals will be composed of modules interconnected using analog, digital, intermediate frequency (IF), and RF interfaces. The contractor should specify these internal interfaces employing industry standard interfaces and protocols (e.g., RS-170 or National Television Standards Committee (NTSC) for analog video, RS-232/-422/-449 for serial data, and 70 MHz for IF signal processing) to the maximum extent possible. It is also expected that modules in both the airborne and surface terminals will communicate command and status information over a common bus. The bus architecture is to be defined by the contractor; however, it is desirable that this architecture employ common industry standards and protocols.

A3.8 Communications Security (COMSEC)

The design is required to be capable of incorporating data encryption using KGV-68B cryptographic devices to encrypt both the command link and the return link. Encryption must be capable of being disabled for applications not requiring secure communications. Methods for disabling or bypassing encryption must meet the requirements of the National Security Agency (NSA). It is expected that the contractor will ensure that their design meets NSA requirements. It will not be necessary for the Contractor to furnish the COMSEC devices.

A3.9 Airborne Terminal Size, Weight, and Power (SWAP)

The TCDL airborne terminal SWAP constraints will be a function of the UAV platform on which it is installed. It is expected that the Outrider UAV will be the most limiting case, and Phase 2 implementations must be targeted toward the Outrider SWAP constraints. Proposals should be based on the current Outrider data link SWAP constraints listed below.

- Weight: 16.5 lbs. total, including the antenna(s)

- Dimensions: 10 in. x 23 in. x 3 in., excluding the antenna(s)
- Allocated Power: 300 watts peak at 28 vdc
- The Outrider antenna is mounted on top of fuselage

The TCDL airborne terminal equipment for Outrider, including platform specific interfaces, must stay within the Outrider SWAP constraints specified herein. For other platform application, variations on the Outrider SWAP requirements are acceptable.

A3.10 Airborne Terminal Environmental Considerations

The TCDL airborne terminal is required to perform in the following environmental conditions. (Refer to the Predator Digital Data Link system, Specification 8110826, Paragraph 3.2.3.1).

- Temperature:
  - -30°C to +49°C (operational)
  - -30°C to +71°C (transit and storage)
- Altitude:
  - Sea level to 25,000 feet (operational)
  - Sea level to 40,000 feet (transit and storage)
- Humidity and Moisture: Operational in 0% to 90% humidity with no condensation.
- Fungus: As Specified in MIL-STD 5400, paragraph 3.2.24.8
- Dust: As Specified in MIL-STD 5400, paragraph 3.2.24.7
- Shock:
  - Shall withstand 20 g, 11 millisecond half sine, any direction (non-operating)
  - Shall withstand 6g, 63 millisecond sawtooth any direction (operating)
- Vibration: Refer to Predator Specification 8110826, paragraph 3.2.3.1.7
- Explosive Atmosphere: As Specified in MIL-STD 5400, paragraph 3.2.24.10

A3.11 Surface Terminal Packaging

The TCDL surface terminal electronics are required to be packaged to be easily transportable (e.g., tactical transit cases transported in a High Mobility Multipurpose Wheeled Vehicle (HMMWV)), and for operation in a tactical environment. The TCDL is required to be integrated directly into existing TUAV ground control systems including TCS and must be capable of setup and operation by two persons in one hour or less. The contractor is required to determine a feasible and practical method for integrating TCDL into Predator and Outrider Ground Control Systems.

A3.12 Surface Terminal Antenna

The contractor is required to provide a surface terminal antenna system that will support the UAV mission requirements. This includes the following:

- Line of site slant range requirement
- Link availability requirements
- Close-in operation (Take-off /Recovery of UAV's)

Multiple antenna solutions are acceptable (e.g., omni-directional and directional). Should a directional antenna be proposed, the system must include the antenna, electronics to control the antenna for tracking and pointing, and the pedestal. UAV position data is available, via the return link, should it be required by the antenna system as an aid in antenna pointing. The surface terminal must be capable of providing its own location reference if required for antenna tracking and pointing. The exact antenna configuration will be defined by the contractor. The form factor and aperture size must be consistent with a tactical system.

A3.13 Surface Terminal Environmental Considerations

The TCDL surface terminal is required to perform in the following environmental conditions. (Refer to the Predator Digital Data Link system, Specification 8110826, Paragraph 3.2.3.2.)

- Temperature:
  - -30°C to +30°C (operational)
  - -30°C to +71°C (transit and storage)
- Altitude:
  - Sea level to 10,000 feet (operational);
  - Sea level to 40,000 feet (transit and storage)
- Humidity and moisture: Operational to 90% humidity with no condensation
- Fungus: As specified in MIL-STD 5400, paragraph 3.2.24.8
- Dust: As specified in MIL-STD 5400, paragraph 3.2.24.7
- Shock: Shall withstand 20 g, 11 millisecond half sine, any direction (non-operating)

A3.14 Electromagnetic Interference Requirements

The Outrider mission is to operate at low altitudes over battlefields that could expose the UAV to high RF environments. Therefore, special attention must be given to hardening the TCDL to an appropriate level. To ensure that EMI emissions and susceptibility is appropriately controlled on military platforms, the DOD requires that all new and upgraded equipment meet the requirements of MIL-STD-461D and be tested in accordance with MIL-STD-462D. To comply with the US Army, US Navy, and US Air Force requirements, the TCDL must meet the following MIL-STD-461D basic test requirements (Note: It is assumed that the TCDL will be classified as a mission-

critical subsystem on aircraft). Additional information concerning EMI may be found on the TCDL Internet home page and in the TCDL Reading Room.

- CE101 (Conducted emissions on power leads, 30 Hz to 10 kHz; Army requirement only)
- CE102 (Conducted emissions on power leads, 10 kHz to 10 MHz; required by all three Services)
- CS101 (Conducted susceptibility of power leads, 30 Hz to 50 kHz; required by all three Services)
- CS114 (Conducted susceptibility, bulk cable injection; 115 dBμA at 10 kHz to 200 MHz; required by all three Services)
- CS115 (Conducted susceptibility, bulk cable injection, impulse excitation; required by all three Services)
- CS116 (Conducted susceptibility of cables and power leads from damped sinusoidal transients, 10 kHz to 100 MHz; Only required by Navy and Air Force)
- RE101 (Radiated emissions, electric field, 30 Hz to 100 kHz; Army requirement only)
- RE102 (Radiated emissions, magnetic field, 10 kHz to 18 GHz; required by all three Services)
- Radiated susceptibility, magnetic field; 30 Hz to 100 kHz; Army requirement only)
- RS103 (Radiated susceptibility, electric field; Army: 200 volts/meter at 10 kHz to 18 GHz, Navy: 20 V/m at 10 kHz to 2 MHz, 200 V/m at 2 MHz to 18 GHz; Air Force: 20 V/m at 10 kHz to 1 GHz, 60 V/m at 1 to 18 GHz)

A3.15 Reliability

The minimum reliability requirements for TCDL is 1000 hours Mean Time Between Failure (MTBF).

A3.16 Status Monitoring and Reporting

TCDL equipment will have provisions for built-in system checks and testing prior to and during flight operations. System status must be conveyed to operators.

A3.17 Maintenance, Repair and Logistic Support

The contractor will propose repair and maintenance concepts in their proposal. The contractors will identify the lowest levels of repair, replacement parts, operator and maintenance personnel tasks, anticipated test equipment, special tools, and overall logistic support concept.

A4.0 Technical Goals

This section describes the technical goals of the TCDL acquisition program. It is not necessary that contractors meet all of these goals in the initial TCDL system design. The contractor is expected to analyze the feasibility and practicality of achieving these goals in the TCDL design. The analyses should quantify tradeoffs to the TCDL in terms of cost, size, weight, power, and performance for choices that have significant advantages to the Government for future adaptation of the TCDL equipment.

A4.1 Affordability

The affordability goals for the TCDL are as follows:

- Airborne terminal: $25,000
  - Includes antenna(s), RF elements, IF elements, modem, and external interfaces
  - Production quantities of 100
- Platform-specific interface module: $15,000
  - Includes video imagery analog-to-digital conversion, imagery compression, multiplexing the compressed imagery with Outrider telemetry data, COMSEC module, etc.)
  - Production quantities of 100
- Airborne terminal installation: $10,000 (Includes mounting plates, cables and connectors, special documentation, and other costs required to support installation)
- Surface terminal: $200,000
  - Includes all surface equipment including antenna(s), RF elements, IF elements, modem, external interface, video imagery reconstruction, and demultiplexing
  - Production quantities of 20
- Remote Video Terminal: $10,000
  - Includes all surface equipment including antenna(s), RF elements, IF elements, demodulator, video imagery reconstruction, demultiplexing, and external interface
  - Production quantities of 100

The KGV-68B COMSEC device will be provided as GFE and its cost is not included in the $15,000 platform specific module cost goal. The contractor may reallocate the installation and the airborne terminal costs as long as the aggregate cost does not exceed $35,000. The

affordability goals apply to future production costs and not to the costs of producing the prototype units in Phase 2 of this acquisition.

A4.2 Open System Architecture

An important goal of the TCDL architecture is that it incorporate an open system architecture that provides the following characteristics. (Appendix A provides an example open system architecture approach.)

- Provide the flexibility to quickly and easily change system attributes to accommodate varying user and mission requirements, such as the capability to change sensor inputs during flight, and to accommodate a variety of users through software changes rather than hardware changes
- Provide the expandability to add new features and functions without system redesign
- Provide the scalability and growth capability to support alternative sensor platforms, airborne and surface platforms, communications relays, and non-CDL wideband data link applications
- Provide the modularity to change system attributes by physically changing modules of hardware or software, such as might be required to reconfigure an airborne terminal to support a different platform, and to allow implementation by a variety of contractors, through the use of widely available commercial-off-the shelf circuit cards and components
- Choose and place the physical and functional boundaries of the partitions so they coincide and can be implemented with commercial-off-the-shelf parts

The contractor should identify the physical and functional interfaces that define the open architecture of the selected design. The architecture should include a specification of the form, fit, and function for each module and the chassis. The contractor is expected to select module form factors and a module interconnect or backplane that conform to an industry standard in accordance with open systems architecture. The contractor should develop a detailed physical implementation of the selected design. The physical implementation should include size, weight, power, reliability, and other important characteristics. The contractor is strongly encouraged to utilize commercial items down to the device level to the maximum extent practical, and to provide justification for any exceptions. The contractor is expected to define the software to be developed for each module, including an estimate of lines of code, and should specify the industry open systems standards and protocols that will be used.

A4.3 Modular, Scalable Architecture

The TCDL architecture is expected to be modular and scalable enough that, as new sensors and users begin employing the TCDL system, the hardware does not require a complete redesign. Anticipated future platforms and sensors include UAV’s, medium altitude manned aircraft, high rate digital Imagery Intelligence (IMINT) sensors, and Signal Intelligence (SIGINT) sensors. The exact level of modularity and scalability should be contractor defined and specified.

A4.4 Commercial-Off-The-Shelf (COTS) Technology

The TCDL architecture should employ as many COTS components as practical, and should utilize an open systems architecture servicing Open Systems Interconnections (OSI). The level of modularity, and the utilization of COTS and OSI is to be developed and specified by the contractor.

4.5 X-Band Operation Adaptation

The contractor should demonstrate by an analysis the ability to change the RF frequency from Ku band to X band. The analysis should show all modifications required to the Ku band unit to convert to X band. The contractor has the freedom to study, propose, and present options for using TCDL in frequency bands in addition to Ku and X.

A4.6 Antenna System Adaptation

The TCDL system is anticipated to have future requirements to interface to different antenna systems (e.g., it may be integrated onto a manned airborne platform). The contractor is expected to demonstrate by an analysis the ability to change from the TUAV antenna system to a different antenna system. The analysis should as a minimum address tracking, pointing, and fixed antenna types. The analysis should indicate all modifications required to TCDL to accommodate the different antenna systems and should address interface processor software related to the antenna system.

A4.7 Flexible Multiplex Structures

A TCDL design goal is to develop a multiplexing/demultiplexing structure that provides flexibility for interfacing to current and future systems. The contractor is encouraged to incorporate a flexible multiplexing method. Standard commercial Digital Service (DS) rates, Asynchronous Transfer Mode (ATM) and standard networking technologies should be considered for digital multiplexing. The contractor is expected to prepare tradeoff analyses showing all modifications required to the basic TCDL to accommodate different multiplex structures. It is highly desirable that the external interfaces be reconfigurable both quickly and inexpensively (i.e., software reconfigurable).

A4.8 Multiple Modes Of Operation

In addition to the requirement that TCDL be interoperable, it is also desirable to develop a TCDL system that functions not only in the CDL interoperable mode, but also functions in a general purpose non-CDL modes. The contractor is encouraged to incorporate non-CDL modes of operation in the design. Consideration should be given to the following design attributes:

- Variable data rates: It is desirable to operate at data rates other than the required 10.71 Mbps. This includes lower data rates that require less bandwidth and higher data rates that can accommodate more demanding sensors. The target data rates

should be multiples of the DS-1 rate (i.e., 1.544 Mbps). The contractor is encouraged to explore high data rate modes (e.g., DS-3, or 45 Mbps). The optimal system would include programmable data rates.

- Additional waveforms: In non-CDL modes of operation, the CDL waveform is not required. A goal is for the TCDL equipment is to incorporate non-CDL waveforms (e.g., the Predator SATCOM waveform, variations in forward error correction coding, and variations in modulation technique).
- Full Duplex Operation: The CDL interoperable mode incorporates asymmetrical forward and return data rates. A goal is for a non-CDL mode to exist which incorporates a full duplex, symmetrical forward and return links.
- Air-to-Air Mode of Operation: A goal is for the TCDL to be capable of supporting air-to-air communications.
- Programmable: A goal is for TCDL to change operating modes with minimum changes in hardware configuration.

A4.9 Elimination of the Intermediate Frequency

Contractors are encouraged to determine by analysis the best design alternative for the IF, modulator, and demodulator. The analysis should consider available commercial components, and should emphasize the objective of avoiding penalties to the TCDL design. The contractor should quantify tradeoffs to the TCDL equipment suite in terms of cost, size, weight, power, and performance for intermediate frequency, modulator and demodulator choices that have significant advantages to the Government for future adaptation of the TCDL. If applicable, the analysis should demonstrate the ability of the design to accommodate future insertion of evolving technology.

A4.10 Built-In-Test (BIT) Capability

A TCDL program goal is for the TCDL to incorporate in the design such that a BIT wraparound signal implementation permits use of the same module(s) for both surface and airborne platform applications. The same modules that generate the operational waveforms also generate the wraparound waveforms which increases the complexity and attendant cost of the modules. The contractors analysis will determine the impact on the TCDL cost and complexity to utilize a design with BIT wrap-around signal implementation.

A4.11 Full CDL Interoperability

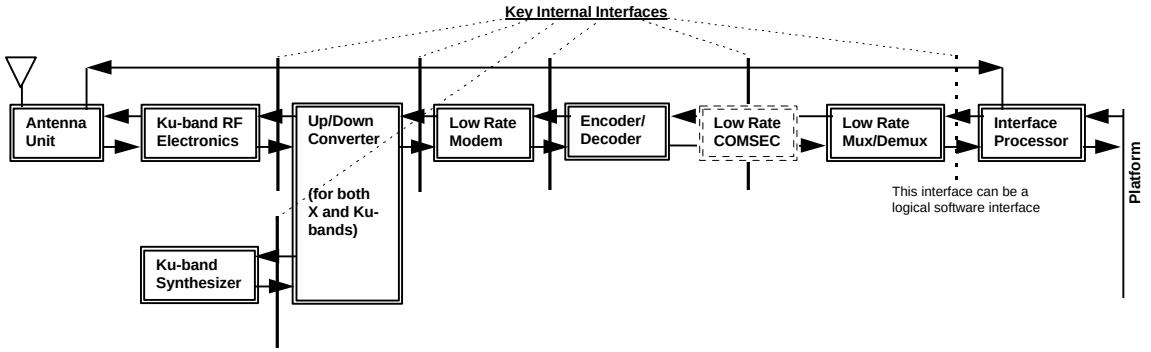
Paragraph A3.1 specifies CDL interoperability requirements that are in partial compliance with the CDL specification. A goal of this acquisition is to be fully compliant with the narrowband mode of the CDL specification.

Appendix A
Example Open Systems Architecture

AA1.0 Elements of Open Architecture

The following is a presentation of an example open systems architecture approach. This example architecture is provided convey the Government's objectives of an open architecture for the TCDL design. Contractors are not required to adhere to this particular architecture but are encouraged to produce an architecture with similarly open basic elements:

AA1.1 Description of Architecture Elements.



The architecture elements are defined by partitions at key internal interfaces. Between these interfaces are modules that perform generic functions associated with line-of-sight transmission and reception of wideband digital information. A module can consist of one or more items (i.e., circuit cards, daughter cards). The Government anticipates that this architecture can be implemented with commercially available components (including field programmable gate arrays), circuit cards, chassis, etc.

AA1.2 Module Descriptions.

AA1.2.1 Interface Processor.

The Interface Processor provides the external interface to a platform, and provides data link related processing. For CDL, this processing includes functions such as link control, navigation control, antenna control, and Continuously Variable Slope Delta (CVSD) voice processing. [The TCDL does not implement voice processing.] The Interface Processor module can potentially interface with diverse sensor and avionics suites on a platform as well as diverse and changing exploitation site networks and systems. This situation will be multiplied by new applications and data links, which may have totally different interface and link processing needs than CDL systems. The Interface Processor implementation should be adaptable for these future interfaces and future link processing capabilities.

AA1.2.2 Mux/Demux

The Low Rate Mux/Demux provides multiplexing of the data into (and demultiplexing from) the channel structure required for the data link. For CDL, this includes both the 200 Kbps command (or forward) link and the 10.71 Mbps return link. This CDL channel structure may evolve to current or future standards set by the telecommunications industry, such as DS-1 (1.544 Mbps) or DS-3 (44.736 Mbps). The Mux/Demux implementation should be adaptable to allow for future use of these channelization standards.

AA1.2.3 Communications Security

The Low Rate COMSEC (KGV-68B) provides data encryption. For CDL, the command link and the 10.71 Mbps return link can be encrypted.

AA1.2.4 Encoder/Decoder

The Low Rate Encoder/Decoder encodes, decodes, interleaves, and deinterleaves the data stream. CDL uses convolutional encoding and Viterbi decoding. Future user applications may use additional and different error coding techniques to gain link margin and save costs (in exchange for system bandwidth). The Encoder/Decoder implementation should be adaptable to incorporate such techniques.

AA1.2.5 Modem

The Low Rate Modem modulates baseband data and outputs a signal at the intermediate frequency (IF) and demodulates the IF and outputs baseband data. For CDL, this includes BPSK modulation and PN generation (for spread spectrum) on the command link and Offset-QPSK modulation on the return link. Future user applications may require other variations of these modulation techniques. The Modem implementation should be adaptable for these variations.

AA1.2.6 Upconverter, Downconverter, and Synthesizer

The Upconverter provides for conversion of the signal from the IF to the appropriate transmission frequency (and vice versa for the Downconverter), in conjunction with the Synthesizer for the appropriate frequency band. For CDL, the uplink and downlink bands are Ku or X. Additional bands may be used for future applications.

AA1.2.7 RF Electronics (RFE)

The RFE provides the power amplification for transmission and low noise amplification on reception that are tailored to the frequency band used. For CDL, the frequency bands are Ku and X. [The TCDL will use the Ku-band.] Additional bands may be used for future applications.

AA1.2.8 Antenna

The Antenna Unit includes the antenna, including electronics to control the antenna for tracking or pointing, and a pedestal. Antenna units may differ by platform, in order to achieve the required link margin and physical packaging.

AA1.3 Key Internal Interfaces.

AA1.3.1 Interface Processor to Low Rate Mux/Demux Interfaces

Interface Processor to Low Rate Mux/Demux Interfaces are specified to allow for different platform interfaces and/or data link channelization structures. (These two functional modules are not required to be physically separated into two physical modules. If both functions are implemented via software on a single processor, the interface to be specified is the software interface. The goal is to ensure that the Interface Processor functions can be changed without impacting the Mux/Demux function and vice versa.)

AA1.3.2 Low Rate Mux/Demux to Low Rate Encoder/Decoder Interfaces

Low Rate Mux/Demux to Low Rate Encoder/Decoder Interfaces are specified to allow for the insertion of COMSEC functions.

AA1.3.3 Low Rate Encoder/Decoder-to-Low Rate Modem Interfaces and Low Rate Modem-to-Upconverter/Downconverter Interfaces

Low Rate Encoder/Decoder to Low Rate Modem Interfaces and Low Rate Modem to Upconverter/Downconverter Interfaces are specified to allow for different waveforms, which may necessitate replacement of the Low Rate Modem module. The goal is to accommodate different waveforms through software changes rather than replacement of hardware.

AA1.3.4 Upconverter/Downconverter-to-Synthesizer Interfaces and the Upconverter/Downconverter-to-RF Electronics Interfaces

Upconverter/Downconverter-to-Synthesizer Interfaces and the Upconverter/ Downconverter-to-RF Electronics Interfaces are specified to allow for communications on another frequency band, which will likely require a synthesizer module and RF Electronics module for that band.

GLOSSARY

ATE	Airborne Terminal equipment
ATM	Asynchronous Transfer Mode
BER	Bit Error Rate
BIT	Built-In-Test
BPSK	Binary Phase Shift Keying
CDL	Common Data Link
COMSEC	Communications Security
CONOPS	Concept of Operations
COTS	Commercial-Off-The-Shelf
CVSD	Continuously Variable Slope Delta
DARO	Defense Airborne Reconnaissance Office
D/D JPO	DARPA/DISA Joint Program Office
DEMUX	Demultiplexer
DS	Digital Service
HMMWV	High Mobility Multi-Wheeled Vehicle
ICD	Interface Control Document
IDL	Interoperable Data Link
IF	Intermediate Frequency
IMINT	Imagery Intelligence
IV&V	Independent Verification and Validation
Kbps	Kilobits per Second
LMA	Link Management Assembly
LOS	Line of Sight
Mbps	Megabits per Second
MUX	Multiplexer
NSA	National Security Agency
O-QPSK	Offset-Quadrature Phase Shift Keying
PN	Pseudorandom Number
RF	Radio Frequency
RFE	Radio Frequency Electronics
SATCOM	Satellite Communications
SIGINT	Signal Intelligence
SPMA	Sensor Processor Modem Assembly
STE	Surface Terminal Equipment
SWAP	Size, Weight, and Power
TCDL	Tactical Common Data Link
TCS	Tactical Control System
TUAV	Tactical Unmanned Aerial Vehicle
UAV	Unmanned Aerial Vehicle

ATTACHMENT B

TACTICAL COMMON DATA LINK

MODEL AGREEMENT

Agreement

Between

(INSERT COMPANY NAME AND ADDRESS)

and

The Defense Advanced Research Projects Agency (DARPA)
3701 North Fairfax Drive
Arlington, Virginia 22201-1714

Concerning the
Tactical Common Data Link (TCDL) Program

Agreement No.: MDA972-97-C-XXXX
Military Customer Funding document number:
Total Amount of the Agreement: $
Total Estimated Government Funding of the Agreement: $
Total Incremental Funding Available for Obligation: $
Effective Date of this Action:
Authority: 10 U.S.C. § 2371 and Section 845 of the 1994 National Defense Authorization Act, as amended by Section 804 of the 1997 National Defense Authorization Act (P.L. 104-201).
Line of Appropriation: AA

This Agreement is entered into between the United States of America, hereinafter called the Government, represented by (DARPA) and (INSERT COMPANY NAME) pursuant to and under U.S. Federal law.

FOR (INSERT COMPANY NAME)	FOR THE UNITED STATES OF AMERICA (DARPA)
(Signature)	(Signature)
(Name, Title) (Date)	(Name, Title) (Date)

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ATTACHMENTS

ARTICLE I SCOPE OF THE AGREEMENT

A. Background

1. THIS PARAGRAPH(S) DESCRIBES THE VISION OF THE PROGRAM AND SHOULD ANSWER THE FOLLOWING QUESTIONS: WHAT IS THE AGREEMENT ALL ABOUT? WHAT IS THE SYSTEM CURRENTLY FIELDED? WHO IS THE MILITARY CUSTOMER? WHAT IS THE COMMERCIAL PRODUCT BEING INSERTED? WHERE IS THE SAVINGS REALIZED AND OVER WHAT PERIOD OF TIME? ARE THERE ADDITIONAL DUAL-USE (MILITARY AND COMMERCIAL) APPLICATIONS BEYOND THE GOALS OF THIS PROGRAM?

B. Scope

1. (COMPANY NAME) shall perform a research and development program (Program) including test and qualification for insertion of a commercial product into an existing military system described as follows:

(INSERT RESEARCH AND DEVELOPMENT EFFORT).

The research shall be carried out in accordance with the Technical Requirements and Goals, incorporated from the solicitation (Attachment A), incorporated in this Agreement as Attachment 1. (COMPANY NAME) shall submit or otherwise provide all documentation required by Attachment 2, Report Requirements.

2. (COMPANY NAME) shall be paid for each Payable Milestone accomplished in accordance with the Schedule of Payments and Payable Milestones set forth in Attachment 3 and the procedures of Article V. Both the Schedule of Payments and the Funding Schedule, set forth in Attachments 3 and 4 respectively, may be revised or updated in accordance with Article III.

3. The Government and COMPANY NAME (Parties) estimate that the Technical Requirements and Goals of this Agreement can only be accomplished with an (COMPANY NAME) aggregate resource contribution of $ (INSERT DOLLAR AMOUNT) from the effective date of this Agreement through (INSERT NUMBER OF MONTHS) months thereafter. (COMPANY NAME) intends and, by entering into this Agreement, undertakes to cause these funds to be provided. (COMPANY NAME) contributions will be provided as detailed in the Funding Schedule set forth in Attachment 4. If either DARPA or (COMPANY NAME) is unable to provide its respective total contribution, the other Party may reduce its project funding by a proportional amount.

C. Goals / Objectives

1. The goal of this Agreement is (INSERT GOAL(S) OF AGREEMENT).

2. The Government will have continuous involvement with COMPANY NAME. The Government may also obtain access to research results and certain rights in data and patents pursuant to Articles VII and VIII. DARPA and (COMPANY NAME) are bound to each other by a duty of good faith and best research effort in achieving the goals of the Program.

3. This Agreement is an "other transaction" pursuant to 10 U.S.C. § 2371 and section 845 of the 1994 National Defense Authorization Act as amended. The Parties agree that the principal purpose of this Agreement is for the Government to support and stimulate COMPANY NAME to provide its best efforts in the development of a commercial prototype for insertion into fielded Department of Defense military systems. The Federal Acquisition Regulation (FAR) and Department of Defense FAR Supplement (DFARS) apply only as specifically referenced herein. This Agreement is not a procurement contract or grant agreement for purposes of FAR Subpart 31.205-18.

ARTICLE II TERM

A. The Term of this Agreement

The Program commences upon the date of the last signature hereon and continues for twenty-four (24) months, Phases 1 and 2. If all funds are expended prior to the (INSERT NUMBER OF MONTHS) ( )-month duration, the Parties have no obligation to continue performance. Provisions of this Agreement, which, by their express terms or by necessary implication, apply for periods of time other than specified herein, shall be given effect, notwithstanding this Article.

B. Termination Provisions

Subject to a reasonable determination that the Program will not produce beneficial results commensurate with the expenditure of resources, either Party may terminate this Agreement by written notice to the other Party, provided that such written notice is preceded by consultation between the Parties. In the event of a termination of the Agreement, it is agreed that disposition of Data developed under this Agreement, shall be in accordance with the provisions set forth in Article VIII, Data Rights. The Government and (COMPANY NAME) will negotiate in good faith a reasonable and timely adjustment of all outstanding issues between the Parties as a result of termination. Failure of the Parties to agree to a reasonable adjustment will be resolved pursuant to Article VI, Disputes. The Government has no obligation to reimburse (COMPANY NAME) beyond the last completed and paid milestone if (COMPANY NAME) decides to terminate.

C. Extending the Term

The Parties may extend by mutual written agreement the term of this Agreement if funding availability and performance reasonably warrant. Any extension shall be formalized through bilateral modification of the Agreement by the Agreements Officer and the (COMPANY NAME) Administrator.

ARTICLE III MANAGEMENT OF THE PROJECT

(NOTE: THIS ARTICLE MAY BE SUBSTANTIALLY REVISED DEPENDING ON THE FACTS OF EACH AGREEMENT.)

A. Management and Program Structure

COMPANY NAME shall be responsible for the overall technical and program management of the Program, and technical planning and execution shall remain with COMPANY NAME. The Government shall provide recommendations to program developments and technical collaboration and be responsible for the review and verification of the Payable Milestones.

B. Phase 1 Management Planning Process

Program planning will consist of a Program Plan with inputs and review from (COMPANY NAME) and the Government, containing the detailed schedule of research activities and payable milestones. The Phase 1 Plan will consolidate adjustments in the research schedule, including revisions/modification to payable milestones.

1. Initial Phase 1 Plan: (COMPANY NAME) will follow the initial program plan that is contained in Attachment 1, Technical Requirements and Goals, and Attachment 3, Schedule of Payments and Payable Milestones

2. Overall Program Plan Annual Review

(a) (COMPANY NAME), with the Government’s review, will prepare an overall Program Plan. The Program Plan will be presented and reviewed at a review which will be attended by (COMPANY NAME) Management, the Government, senior service management as appropriate, and other service program managers and personnel as appropriate. (COMPANY NAME), with (DARPA) participation and review, will prepare a final Program Plan.

(b) The Program Plan provides a detailed schedule of research activities, commits (COMPANY NAME) to use its best efforts to meet specific performance objectives, including a forecast of expenditures, and describes the Payable Milestones. The Program Plan will consolidate all prior adjustments in the research schedule, including revisions and modifications to payable milestones. Recommendations for changes, revisions, or modifications to the Agreement which result from the Review shall be made in accordance with the provisions of Article III, Section C.

C. Modifications

1. As a result of meetings, annual reviews, or at any time during the term of the Agreement, research progress or results may indicate that a change in the Technical Requirements and Goals, or the Payable Milestones, would be beneficial to program objectives. Recommendations for modifications, including justifications to support any changes to the Technical Requirements and Goals, or the Payable Milestones, will be documented in a letter and submitted by (COMPANY NAME) to (DARPA) with a copy to the Government Agreements Officer. This documentation letter will detail the technical, chronological, and financial impact of the proposed modification to the research program. (COMPANY NAME) shall approve any Agreement modification. The Government is not obligated to pay for additional or revised Payable Milestones until the Payable Milestones Schedule (Attachment 3) is formally revised by the Government Agreements Officer and made part of this Agreement.

2. (DARPA) shall be responsible for the review and verification of any recommendations to revise or otherwise modify the Technical Requirements and Goals, Schedule of Payments or Payable Milestones, or other proposed changes to the terms and conditions of this Agreement.

3. For minor or administrative Agreement modifications (e.g. changes in the paying office or appropriation data, changes to Government or (COMPANY NAME) personnel identified in the Agreement, etc.), no signature is required by (COMPANY NAME).

ARTICLE IV AGREEMENT ADMINISTRATION

Unless otherwise provided in this Agreement, approvals permitted or required to be made under this agreement may be made only by the Government Agreements Officer. Administrative and contractual matters under this Agreement shall be referred to the following representatives of the parties:

GOVERNMENT CUSTOMER: (INSERT NAME) (Agreements Officer) (INSERT TELEPHONE NUMBER)

COMPANY NAME: (INSERT NAME) (COMPANY NAME Administrator) (INSERT TELEPHONE NUMBER)

Technical matters under this Agreement shall be referred to the following representatives:

GOVERNMENT CUSTOMER: (INSERT NAME) (Program Manager) (INSERT TELEPHONE NUMBER)

COMPANY NAME: (INSERT NAME) (INSERT TITLE) (INSERT TELEPHONE NUMBER)

Each party may change its representatives named in this Article by written notification to the other party.

ARTICLE V OBLIGATION AND PAYMENT

A. Obligation

1. The Government's liability to make payments to (COMPANY NAME) is limited to only those funds obligated under the Agreement or by modification to the Agreement. The government may obligate funds to the Agreement incrementally.

2. If modification becomes necessary in performance of this Agreement, pursuant to Article III, paragraph B, the Government Agreement Officer and (COMPANY NAME) Administrator shall execute a revised Schedule of Payable Milestones consistent with the then current Program Plan.

B. Payments

1. (COMPANY NAME) has and agrees to maintain an established accounting system which complies with Generally Accepted Accounting Principles and the requirements of this Agreement, and shall ensure that appropriate arrangements have been made for receiving, distributing and accounting for Federal funds. An acceptable accounting system is one in which all cash

receipts and disbursements are controlled and documented properly.

2. (COMPANY NAME) shall document the accomplishments of each Payable Milestone by submitting or otherwise providing the Payable Milestones Report required by Attachment 2, Part D. (COMPANY NAME) shall submit an original and one (1) copy of all invoices to the Agreement Officer for payment approval. After written verification of the accomplishment of the Payable Milestone by the Government, and approval by the Agreement Officer, the invoices will be forwarded to the payment office within fifteen (15) calendar days of receipt of the invoices at (DARPA). Payment approval for the final Payable Milestone will be made after reconciliation (INSERT APPROPRIATE DFAS OFFICE) within fifteen (30) calendar days of (DARPA) transmittal. Subject to change only through written Agreement modification, payment shall be made to the address of the (COMPANY NAME) Administrator set forth below.

3. Address of Payee: (INSERT NAME AND ADDRESS OF PAYEE)

4. Limitation of Funds: In no case shall the Government's financial liability exceed the amount obligated under this Agreement.

5. Financial Records and Reports: (COMPANY NAME) shall maintain adequate records to account for all funding received under this Agreement and shall maintain adequate records to account for (COMPANY NAME) funding provided for under this Agreement. Upon completion or termination of this Agreement, whichever occurs earlier, the (COMPANY NAME) Administrator shall furnish to the Agreement Officer a copy of the Final Report required by Attachment 2, Part E. (COMPANY NAME)'s relevant financial records are subject to examination or audit on behalf of (INSERT GOVERNMENT CUSTOMER) by the Government for a period not to exceed three (3) years after expiration of the term of this Agreement. The Agreement Officer or designee shall have direct access to sufficient records and information of (COMPANY NAME), to ensure full accountability for all funding under this Agreement. Such audit, examination, or access shall be performed during business hours on business days upon prior written notice and shall be subject to the security requirements of the audited party.

ARTICLE VI DISPUTES

A. General

The Parties shall communicate with one another in good faith and in a timely and cooperative manner when raising issues under this Article.

B. Dispute Resolution Procedures

1. Any disagreement, claim or dispute between (DARPA) and (COMPANY NAME) concerning questions of fact or law arising from or in connection with this Agreement, and, whether or not involving an alleged breach of this Agreement, may be raised only under this Article.

2. Whenever disputes, disagreements, or misunderstandings arise, the Parties shall attempt to resolve the issue(s) involved by discussion and mutual agreement as soon as practicable. In no event shall a dispute, disagreement or misunderstanding which arose more than three (3) months prior to the notification made under subparagraph B.3 of this article constitute the basis for relief under this article unless the official designated in paragraph 4, in the interests of justice waives this requirement.

3. Failing resolution by mutual agreement, the aggrieved Party shall document the dispute, disagreement, or misunderstanding by notifying the other Party (through the government Agreement Officer or Company Administrator, as the case may be) in writing of the relevant facts, identify unresolved issues, and specify the clarification or remedy sought. Within five (5) working days after providing notice to the other Party, the aggrieved Party may, in writing, request a joint decision by the (DARPA LEVEL OF AUTHORITY FAR ENOUGH REMOVED FROM THE PROGRAM TO MAINTAIN A GREATER LEVEL OF IMPARTIALITY) and senior executive (INSERT A LEVEL OF EXECUTIVE FAR ENOUGH REMOVED FROM THE PROGRAM TO MAINTAIN A GREATER LEVEL OF IMPARTIALITY) appointed by (COMPANY NAME). The other Party shall submit a written position on the matter(s) in dispute within thirty (30) calendar days after being notified that a decision has been requested. The (DARPA LEVEL OF AUTHORITY FAR ENOUGH REMOVED FROM THE PROGRAM TO MAINTAIN A GREATER LEVEL OF IMPARTIALITY) and senior executive (INSERT A LEVEL OF EXECUTIVE FAR ENOUGH REMOVED FROM THE PROGRAM TO MAINTAIN A GREATER LEVEL OF IMPARTIALITY), shall conduct a review of the matter(s) in dispute and render a decision in writing within thirty (30) calendar days of receipt of such written position. Any such joint decision is final and binding.

4. In the absence of a joint decision, upon written request to the (DARPA), made within thirty (30) calendar days of the expiration of the time for a decision under subparagraph B.3 above, the dispute shall be further reviewed. The (DARPA) may elect to conduct this review personally or through a designee or jointly with a senior executive (INSERT A LEVEL OF EXECUTIVE FAR ENOUGH REMOVED FROM THE PROGRAM TO MAINTAIN A GREATER LEVEL OF

IMPARTIALITY) appointed by (COMPANY NAME). Following the review, the (DARPA) or designee will resolve the issue(s)and notify the Parties in writing. Such resolution is not subject to further administrative review and, to the extent permitted by law, shall be final and binding.

C. Limitation of Damages

Claims for damages of any nature whatsoever pursued under this Agreement shall be limited to direct damages only up to the aggregate amount of (DARPA) funding disbursed as of the time the dispute arises. In no event shall (DARPA) be liable for claims for consequential, punitive, special and incidental damages, claims for lost profits, or other indirect damages.

ARTICLE VII PATENT RIGHTS

(NOTE: It is the Government's philosophy to allow for innovation in processing, handling and ownership of rights regarding patents conceived or first reduced to practice under this Agreement if it can be proven to be more economically prudent. Offerors should request changes to the clause below in their proposal.)

(NOTE: IN THE EVENT MARCH-IN RIGHTS ARE THE ONLY RIGHTS REASONABLY WARRANTED, THIS ARTICLE SHALL BE REPLACED WITH A CONCISELY WRITTEN ARTICLE DEFINING AND DESCRIBING MARCH-IN RIGHTS AND ANY OTHER APPROPRIATE TERMS.)

A. Definitions

1. "Invention" means any invention or discovery which is, or may be, patented or otherwise protected under Title 35 of the United States Code.

2. "Made" when used in relation to any invention means the conception or first actual reduction to practice of such invention.

3. "Practical application" means to manufacture, in the case of a composition of product; to practice, in the case of a process or method, or to operate, in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is capable of being utilized and that its benefits are, to the extent permitted by law or Government regulations, available to the public on reasonable terms.

4. "Subject invention" means any invention conceived or first actually reduced to practice in the performance of work under this Agreement.

B. Allocation of Principal Rights

Unless (COMPANY NAME) shall have notified (DARPA) (in accordance with subparagraph C.2 below) that (COMPANY NAME) does not intend to retain title, (COMPANY NAME) shall retain the entire right, title, and interest throughout the world to each subject invention consistent with the provisions of this Article and 35 U.S.C. § 202. With respect to any subject invention in which (COMPANY NAME) retains title, (DARPA) shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced on behalf of the United States the subject invention throughout the world.

C. Invention Disclosure, Election of Title, and Filing of Patent Application

1. (COMPANY NAME) shall disclose each subject invention to (DARPA) within four (4) months after the inventor discloses it in writing to his company personnel responsible for patent matters. The disclosure to (DARPA) shall be in the form of a written report and shall identify the Agreement under which the invention was made and the identity of the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological, or electrical characteristics of the invention. The disclosure shall also identify any publication, sale, or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. (COMPANY NAME) shall also submit to (DARPA) an annual listing of subject inventions.

2. If (COMPANY NAME) determines that it does not intend to retain title to any such invention, (COMPANY NAME) shall notify (DARPA), in writing, within eight (8) months of disclosure to (DARPA). However, in any case where publication, sale, or public use has initiated the one (1)-year statutory period wherein valid patent protection can still be obtained in the United States, the period for such notice may be shortened by (DARPA) to a date that is no more than sixty (60) calendar days prior to the end of the statutory period.

3. (COMPANY NAME) shall file its initial patent application on a subject invention to which it elects to retain title within one (1) year after election of title or, if earlier, prior to the end of the statutory period wherein valid patent protection can be obtained in the United States after a publication, or sale, or public use. (COMPANY NAME) may elect to

file patent applications in additional countries (including the European Patent Office and the Patent Cooperation Treaty) within either ten (10) months of the corresponding initial patent application or six (6) months from the date permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications, where such filing has been prohibited by a Secrecy Order.

4. Requests for extension of the time for disclosure election, and filing under Article VII, paragraph C, may, at the discretion of (DARPA), and after considering the position of (COMPANY NAME), be granted.

D. Conditions When the Government May Obtain Title

Upon (DARPA) written request, (COMPANY NAME) shall convey title to any subject invention to (DARPA) under any of the following conditions:

1. If (COMPANY NAME) fails to disclose or elects not to retain title to the subject invention within the times specified in paragraph C of this Article; provided, that (DARPA) may only request title within sixty (60) calendar days after learning of the failure of (COMPANY NAME) to disclose or elect within the specified times.

2. In those countries in which (COMPANY NAME) fails to file patent applications within the times specified in paragraph C of this Article; provided, that if (COMPANY NAME) has filed a patent application in a country after the times specified in paragraph C of this Article, but prior to its receipt of the written request by (DARPA), (COMPANY NAME) shall continue to retain title in that country; or

3. In any country in which (COMPANY NAME) decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceedings on, a patent on a subject invention.

E. Minimum Rights to (COMPANY NAME) and Protection of (COMPANY NAME)’s Right to File

1. (COMPANY NAME) shall retain a nonexclusive, royalty-free license throughout the world in each subject invention to which the Government obtains title, except if (COMPANY NAME) fails to disclose the invention within the times specified in paragraph C of this Article. The (COMPANY NAME) license extends to the domestic (including Canada) subsidiaries and affiliates, if any, within the corporate structure of which (COMPANY NAME) is a party and includes the right to grant licenses of the same scope to the extent that (COMPANY NAME) was legally obligated to do so at the time the Agreement was awarded. The license is transferable only with the approval of (DARPA), except when transferred to the successor of that part of the business to which the invention pertains. (DARPA) approval for license transfer shall not be unreasonably withheld.

2. The (COMPANY NAME) domestic license may be revoked or modified by (DARPA) to the extent necessary to achieve expeditious, practical application of the subject invention pursuant to an application for an exclusive license submitted consistent with appropriate provisions at 37 CFR Part 404. This license shall not be revoked in that field of use or the geographical areas in which (COMPANY NAME) has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of (DARPA) to the extent (COMPANY NAME), its licensees, or the subsidiaries or affiliates have failed to achieve practical application in that foreign country.

3. Before revocation or modification of the license, (DARPA) shall furnish (COMPANY NAME) a written notice of its intention to revoke or modify the license, and (COMPANY NAME) shall be allowed thirty (30) calendar days (or such other time as may be authorized for good cause shown) after the notice to show cause why the license should not be revoked or modified.

F. Action to Protect the Government's Interest

1. (COMPANY NAME) agrees to execute or to have executed and promptly deliver to (DARPA) all instruments necessary to (i) establish or confirm the rights the Government has throughout the world in those subject inventions to which (COMPANY NAME) elects to retain title, and (ii) convey title to (DARPA) when requested under paragraph D of this Article and to enable the Government to obtain patent protection throughout the world in that subject invention.

2. (COMPANY NAME) agrees to require, by written agreement, its employees, other than clerical and non-technical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by (COMPANY NAME) each subject invention made under this Agreement in order that (COMPANY NAME) can comply with the disclosure provisions of paragraph C of this Article. (COMPANY NAME) shall instruct employees, through employee agreements or other suitable educational programs, on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U. S. or foreign statutory bars.

3. (COMPANY NAME) shall notify (DARPA) of any decisions not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceedings on a patent, in any country, not less

than thirty (30) calendar days before the expiration of the response period required by the relevant patent office.

4. (COMPANY NAME) shall include, within the specification of any United States patent application and any patent issuing thereon covering a subject invention, the following statement: "This invention was made with Government support under Agreement No. MDA972-9*-3-00** awarded by (DARPA). The Government has certain rights in the invention."

G. Lower Tier Agreements (Subcontracts)

(COMPANY NAME) shall include this Article, suitably modified, to identify the Parties, in all subcontracts or lower tier agreements, regardless of tier, for experimental, developmental, or research work.

H. Reporting on Utilization of Subject Inventions

(COMPANY NAME) agrees to submit, during the term of the Agreement, an annual report on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by (COMPANY NAME) or licensees or assignees of the inventor. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by (COMPANY NAME), and such other data and information as the agency may reasonably specify. (COMPANY NAME) also agrees to provide additional reports as may be requested by (DARPA) in connection with any march-in proceedings undertaken by (DARPA) in accordance with paragraph J of this Article. Consistent with 35 U.S.C. § 202(c)(5), (DARPA) agrees it shall not disclose such information to persons outside the Government without permission of (COMPANY NAME).

I. Preference for American Industry

Notwithstanding any other provision of this clause, (COMPANY NAME) agrees that it shall not grant to any person the exclusive right to use or sell any subject invention in the United States or Canada unless such person agrees that any product embodying the subject invention or produced through the use of the subject invention shall be manufactured substantially in the United States or Canada. However, in individual cases, the requirements for such an agreement may be waived by (DARPA) upon a showing by (COMPANY NAME) that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that, under the circumstances, domestic manufacture is not commercially feasible.

J. March-in Rights

(COMPANY NAME) agrees that, with respect to any subject invention in which it has retained title, (DARPA) has the right to require (COMPANY NAME), an assignee, or exclusive licensee of a subject invention to grant a non-exclusive license to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if (COMPANY NAME), assignee, or exclusive licensee refuses such a request, (DARPA) has the right to grant such a license itself if (DARPA) determines that:

1. Such action is necessary because (COMPANY NAME) or assignee has not taken effective steps, consistent with the intent of this Agreement, to achieve practical application of the subject invention;

2. Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by (COMPANY NAME), assignee, or their licensees;

3. Such action is necessary to meet requirements for public use and such requirements are not reasonably satisfied by (COMPANY NAME), assignee, or licensees; or

4. Such action is necessary because the agreement required by paragraph (I) of this Article has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such Agreement.

ARTICLE VIII DATA RIGHTS

(NOTE: This article may be substantially revised depending on the facts of each agreement, i.e., “Limited rights” or “March-in rights” are warranted.

It is the Government’s philosophy to allow for innovation in processing, handling and ownership of right regarding technical data and computer software developed under this agreement if it can be proven to be more economically prudent. Offerors should request changes to the clause below in their proposal.

A. Definitions

1. “Government Purpose Rights”, as used in this article, means rights to use, duplicate, or disclose Data, in whole or in part and in any manner, for Government purposes only, and to have or permit others to do so for Government purposes only.

2. “Unlimited Rights”, as used in this article, means rights to use, duplicate, release, or disclose, Data in whole or in part, in any manner and for any purposes whatsoever, and to have or permit others to do so.

3. “Data”, as used in this article, means recorded information, regardless of form or method of recording, which includes but is not limited to, technical data, software, trade secrets, and mask works. The term does not include financial,

administrative, cost, pricing or management information and does not include subject inventions included under Article VII.

B. Allocation of Principal Rights

1. This Agreement shall be performed with mixed Government and (COMPANY NAME) funding. The Parties agree that in consideration for Government funding, (COMPANY NAME) intends to reduce to practical application items, components, and processes developed under this Agreement.

2. (COMPANY NAME) agrees to retain and maintain in good condition until (INSERT NUMBER OF YEAR) ( ) years after completion or termination of this Agreement, all Data necessary to achieve practical application. In the event of exercise of the Government's March-in Rights as set forth under Article VII or subparagraph B.3 of this article, (COMPANY NAME) agrees, upon written request from the Government, to deliver at no additional cost to the Government, all Data necessary to achieve practical application within sixty (60) calendar days from the date of the written request. The Government shall retain Unlimited Rights, as defined in paragraph A above, to this delivered Data.

3. (COMPANY NAME) agrees that, with respect to Data necessary to achieve practical application, (DARPA) has the right to require (COMPANY NAME) to deliver all such Data to (DARPA) in accordance with its reasonable directions if (DARPA) determines that:

(a) Such action is necessary because (COMPANY NAME) or assignee has not taken effective steps, consistent with the intent of this Agreement, to achieve practical application of the technology developed during the performance of this Agreement;

(b) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by (COMPANY NAME), assignee, or their licensees; or

(c) Such action is necessary to meet requirements for public use and such requirements are not reasonably satisfied by (COMPANY NAME), assignee, or licensees.

4. With respect to Data delivered pursuant to Attachment 2 (and listed below), the Government shall receive Government Purpose Rights, as defined in paragraph A above. With respect to all Data delivered, in the event of the Government's exercise of its right under subparagraph B.2 of this article, the Government shall receive Unlimited Rights.

C. Marking of Data

Pursuant to paragraph B above, any Data delivered under this Agreement shall be marked with the following legend: "Use,

duplication, or disclosure is subject to the restrictions as stated in Agreement MDA972- 97-C-XXXX between the Government and (COMPANY NAME)."

D. Lower Tier Agreements

(COMPANY NAME) shall include this Article, suitably modified to identify the Parties, in all subcontracts or lower tier agreements, regardless of tier, for experimental, developmental, or research work.

ARTICLE IX FOREIGN ACCESS TO TECHNOLOGY

(NOTE: It is the Government's intention to restrict this technology from flowing overseas without approval to ensure the economic and security issues have been resolved prior to any release. If the offerors desire proposed changes to this article they should explain rationale completely.)

This Article shall remain in effect during the term of the Agreement and for (INSERT NUMBER OF YEARS) ( ) years thereafter.

A. Definition

1. "Foreign Firm or Institution" means a firm or institution organized or existing under the laws of a country other than the United States, its territories, or possessions. The term includes, for purposes of this Agreement, any agency or instrumentality of a foreign government; and firms, institutions or business organizations which are owned or substantially controlled by foreign governments, firms, institutions, or individuals.

2. "Know-how" means all information including, but not limited to discoveries, formulas, materials, inventions, processes, ideas, approaches, concepts, techniques, methods, software, programs, documentation, procedures, firmware, hardware, technical data, specifications, devices, apparatus and machines.

3. "Technology" means discoveries, innovations, know-how and inventions, whether patented or not, including computer software, recognized under U.S. law as intellectual creations to which rights of ownership accrue, including, but not limited to, patents, trade secrets, maskworks, and copyrights developed under this Agreement.

B. General

The Parties agree that research findings and technology developments arising under this Agreement may constitute a significant enhancement to the national defense, and to the economic vitality of the United States. Accordingly, access to important technology developments under this Agreement by Foreign Firms or Institutions must be carefully controlled. The controls contemplated in this Article are in addition to, and are not intended to change or supersede, the provisions of the International Traffic in Arms Regulation (22 CFR pt. 121 et seq.), the DOD Industrial Security Regulation (DOD 5220.22-R) and the Department of Commerce Export Regulation (15 CFR pt. 770 et seq.)

C. Restrictions on Sale or Transfer of Technology to Foreign Firms or Institutions

1. In order to promote the national security interests of the United States and to effectuate the policies that underlie the regulations cited above, the procedures stated in subparagraphs C.2, C.3, and C.4 below shall apply to any transfer of Technology. For purposes of this paragraph, a transfer includes a sale of the company, and sales or licensing of Technology. Transfers do not include:

(a) sales of products or components, or

(b) licenses of software or documentation related to sales of products or components, or

(c) transfer to foreign subsidiaries of (COMPANY NAME) for purposes related to this Agreement, or

(d) transfer which provides access to Technology to a Foreign Firm or Institution which is an approved source of supply or source for the conduct of research under this Agreement provided that such transfer shall be limited to that necessary to allow the firm or institution to perform its approved role under this Agreement.

2. (COMPANY NAME) shall provide timely notice to (DARPA) of any proposed transfers from (COMPANY NAME) of Technology developed under this Agreement to Foreign Firms or Institutions. If (DARPA) determines that the transfer may have adverse consequences to the national security interests of the United States, (COMPANY NAME), its vendors, and (DARPA) shall jointly endeavor to find alternatives to the proposed transfer which obviate or mitigate potential adverse consequences of the transfer but which provide substantially equivalent benefits to (COMPANY NAME).

3. In any event, (COMPANY NAME) shall provide written notice to the (DARPA) Program Manager and Agreements Officer of any proposed transfer to a foreign firm or institution at least sixty (60) calendar days prior to the proposed date of transfer. Such notice shall cite this Article and shall state specifically what is to be transferred and the general terms of the transfer. Within thirty (30) calendar days of receipt of (COMPANY NAME)'s written notification, the government Agreements Officer shall advise (COMPANY NAME) whether it consents to the proposed transfer. In cases where (DARPA) does not concur or sixty (60) calendar days after receipt and (DARPA) provides no decision, (COMPANY NAME) may utilize the procedures under Article VI, Disputes. No transfer shall take place until a decision is rendered.

4. In the event the transfer of Technology to Foreign Firms or Institutions which is NOT approved by (DARPA), (COMPANY NAME) shall (a) refund to (DARPA) funds paid for the development of the Technology and (b) the Government shall have a non-exclusive, nontransferable, irrevocable, paid-up license to practice, or have practiced on behalf of the United States, the Technology throughout the world for Government and any and all other purposes, particularly to effectuate the intent of this Agreement. Upon request of the Government, the Consortium shall provide written confirmation of such licenses.

D. Lower Tier Agreements (Subcontracts)

(COMPANY NAME) shall include this Article, suitably modified, to identify the Parties, in all subcontracts or lower tier agreements, regardless of tier, for experimental, developmental, or research work.

ARTICLE X CIVIL RIGHTS ACT

This Agreement is subject to the compliance requirements of Title VI of the Civil Rights Act of 1964 as amended (42 U.S.C. 2000-d) relating to nondiscrimination in Federally assisted programs. (COMPANY NAME) has signed an Assurance of Compliance with the nondiscriminatory provisions of the Act.

ARTICLE XI EXECUTION

This Agreement constitutes the entire agreement of the Parties and supersedes all prior and contemporaneous agreements, understandings, negotiations and discussions among the Parties, whether oral or written, with respect to the subject matter hereof. This Agreement may be revised only by written consent of

(COMPANY NAME) and the Government Agreements Officer. This Agreement, or modifications thereto, may be executed in counterparts each of which shall be deemed as original, but all of which taken together shall constitute one and the same instrument.

ARTICLE XII INSURANCE

The contractor shall propose the appropriate type of insurance.

ARTICLE XIII GOVERNMENT FURNISHED PROPERTY

The following Government property, information, equipment, facilities and services shall be provided upon the written approval of the cognizant agreement officer:

A. List of Government Furnished Property

(Offerors will list all desired GFE, GFP, GFI, GFF, and GFS.)

B. Government Responsibility

The Government will use best efforts to deliver to the Contractor, at the time and locations stated in this contract, the Government-furnished property stated in this contract, the Government-furnished property described in the Schedule or specifications.

C. Title Rights

Title to Government-furnished property will remain with the Government. The Contract will use the Government-furnished property only in connection with this contract. The Contractor will maintain adequate property control records in accordance with sound industrial practice and will make such records available.

D. Limitations of Contractor Responsibility and Risk

Upon delivery of Government-furnished property to the Contractor, the Contractor assumes the risk and responsibility for its loss or damage, except --

(1) For reasonable wear and tear;
(2) To the extent property is consumed in performing this agreement; or
(3) As otherwise provided for by the provisions of this agreement.

E. Disposition of Government Furnished Property

Upon completing this agreement, the Contractor will follow the instructions of the Agreements Officer regarding the disposition of all Government-furnished property not consumed in performing this contract or previously delivery to the Government. The Contractor will prepare for shipment, deliver f.o.b. origin, or dispose of the Government property, as may be directed or authorized by the Agreement Officer. The net proceeds of any such disposal will be credited to the agreement price or will be paid to the Government as directed by the Agreement Officer.

ARTICLE XIV: SECURITY

This program shall be provided protection as required by the appropriate security requirements stated on the DD Form 254 (Attachment 5, to be provided by DARPA). The highest level of classification involved in the performance of this agreement is TOP SECRET. It is the Government's position that the highest security classification of any item deliverable as a result of this Agreement is SECRET. However, in order to interface the TCDL system with existing ground stations, and communications networks, it is anticipated that a Contractor may need capability to access and handle access to SENSITIVE COMPARTMENTED INFORMATION (SCI). This Agreement document is unclassified.

ARTICLE XV: WARRANTIES

(Offerors will provide appropriate commercial warranties.)

ARTICLE XVI: ORDER OF PRECEDENCE

In the event of any inconsistency between the terms of this Agreement and language set forth in the Task Description Document, the inconsistency shall be resolved by giving precedence in the following order: (1) The Agreement, (2) Attachments to the Agreement.

ATTACHMENT 1

TASK DESCRIPTION DOCUMENT (TDD)
(Initial Program Plan)

Phase 1

Task 1:

ATTACHMENT 2

REPORT REQUIREMENTS

A. QUARTERLY REPORT

On or before ninety (90) calendar days after the effective date of the Agreement and quarterly thereafter throughout the term of the Agreement, the company shall submit or otherwise provide a quarterly report. Two (2) copies shall be submitted or otherwise provided to the (DARPA) Program Manager, one (1) copy shall be submitted or otherwise provided to the Agreements Officer and one (1) copy shall be submitted or otherwise provided to ((DARPA) PM). The report will have two (2) major sections.

1. Technical Status Report: The technical status report will detail technical progress to date and report on all problems, technical issues or major developments during the reporting period. The technical status report will include a report on the status of consortium collaborative activities during the reporting period.

2. Business Status Report: The business status report shall provide summarized details of the resource status of this Agreement, including the status of the contributions by the Company/Consortium participants. This report will include a quarterly accounting of current expenditures as outlined in the Annual Program Plan. Any major deviations shall be explained along with discussions of the adjustment actions proposed. The report will also include an accounting of interest earned on Government funds, IF ANY. The Company/Consortium is reminded that interest is not expected to accrue under this Agreement. In the event that interest does accrue on Government funds, the Company/Consortium is required to provide an explanation for the interest accrued in the business report. Depending on the circumstances, the Payable Milestones may require adjustment. In any event, the Government reserves the right to require interest amounts earned in excess of $250 per year to be remitted at periodic intervals to be agreed upon by both Parties. All such interest rebates shall be made payable to the United States Treasury.

B. ANNUAL PROGRAM PLAN DOCUMENT

The company shall submit or otherwise provide to the (DARPA) Program Manager one (1) copy of a report which describes the Annual Program Plan as described in Article III, Section D. This document shall be submitted not later than thirty (30)

calendar days following the Annual Site Review as described in Article III, Section D.

C. SPECIAL TECHNICAL REPORTS

As agreed to by the Company/Consortium and the (DARPA) Program Manager, the company shall submit or otherwise provide to the (DARPA) Program Manager one (1) copy of special reports on significant events such as significant target accomplishments by Company/Consortium Members, significant tests, experiments, or symposia.

D. PAYABLE MILESTONES REPORTS

The company shall submit or otherwise provide to the (DARPA) Program Manager, documentation describing the extent of accomplishment of each Payable Milestone. This information shall be as required by Article V, paragraph B and shall be sufficient for the (DARPA) Program Manager to reasonably verify the accomplishment of the milestone of the event in accordance with the Statement of Objectives (SOO) and Task Description Document (TDD).

E. FINAL REPORT

(NOTE: The Final Report is the last Payable Milestone for the completed Agreement.)

1. The Company/Consortium shall submit or otherwise provide a Final Report making full disclosure of all major developments by the Company/Consortium upon completion of the Agreement or within sixty (60) calendar days of termination of this Agreement. With the approval of the (DARPA) Program Manager, reprints of published articles may be attached to the Final Report. Two (2) copies shall be submitted or otherwise provided to the (DARPA) Program Manager and one (1) copy shall be submitted or otherwise provided to (DARPA)/(INSERT PROGRAM OFFICE). One (1) copy shall be submitted to the Defense Technical Information Center, Attn: DTIC-O, 8725 John J. Kingman Road, Suite 0944, Fort Belvoir, VA 22060-6218.

2. The Final Report shall be marked with a distribution statement to denote the extent of its availability for distribution, release, and disclosure without additional approvals or authorizations. The Final Report shall be marked on the front page in a conspicuous place with the following marking: “DISTRIBUTION STATEMENT B. Distribution authorized to U.S. Government agencies only to protect information not owned by the U.S. Government and protected by a contractor’s “limited rights” statement, or received with the understanding that it not be routinely transmitted outside the U.S. Government. Other requests for this document shall be referred to (DARPA)/Technical Information Officer.”

ATTACHMENT 3

SCHEDULE OF PAYMENTS AND PAYABLE MILESTONES

Phase 1

Task	Military Service Month Payment	Company/Consortium Payable Milestones	Payment
1			

Phase 2

Task	Military Service Month Payment	Company/Consortium Payable Milestones	Payment
1			

ATTACHMENT 4

FUNDING SCHEDULE

A. PROJECTED PROGRAM FUNDING COMMITMENTS

Phase 1	Government Funding	Company/Consortium Contribution
FY 9*	$	$
FY 9*	$	$
Phase 2		
FY 9*	$	$
FY 9*	$	$
TOTALS	$	$

B. CONSORTIUM MEMBER CONTRIBUTIONS (If needed)

Member	Phase 1 Contribution	Phase 2 Contribution
Company A	$	$
Company B	$	$
Company C	$	$
Company D	$	$
TOTALS	$	$

ATTACHMENT 5

Contracts Security Classification Specification (DD Form 254)
(to be provided by DARPA)